                              49321-111.ST25.txt
                            SEQUENCE LISTING

<110> Oregon Health & Science University
       Moses, Ashlee
       Fruh, Klaus
       King, Jeffrey S.
       Hicks, James B.
       Raggo, Camilo
       Nelson, Jay

<120> METHODS OF TREATMENT AND DIAGNOSIS OF KAPOSI'S SARCOMA (KS) AND
       KS RELATED DISEASES

<130> 49321-111

<150> US 60/438,343
<151> 2003-01-06

<150> US 60/473,246
<151> 2003-05-22

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<170> PatentIn version 3.2

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Ser Asp Cys Ile Val Val Asp Thr Val Met Cys Pro Asn Met Pro Asn
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Lys Ser Val Leu Leu Tyr Thr Leu Ser Phe Ile Tyr Ile Phe Ile Phe
40   45   50   55

gtc atc ggc atg att gcc aac tcc gtg gtg gtc tgg gtg aat atc cag   364
Val Ile Gly Met Ile Ala Asn Ser Val Val Val Trp Val Asn Ile Gln
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gcc aag acc aca ggc tat gac acg cac tgc tac atc ttg aac ctg gcc   412
Ala Lys Thr Thr Gly Tyr Asp Thr His Cys Tyr Ile Leu Asn Leu Ala
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                              Page 1

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Leu Val Gln His Asn Gln Trp Pro Met Gly Glu Leu Thr Cys Lys Val
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aca cac ctc atc ttc tcc atc aac ctc ttc ggc agc att ttc ttc ctc        556
Thr His Leu Ile Phe Ser Ile Asn Leu Phe Gly Ser Ile Phe Phe Leu
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Val Trp Leu Leu Ala Phe Cys Val Ser Leu Pro Asp Thr Tyr Tyr Leu
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Lys Thr Val Thr Ser Ala Ser Asn Asn Glu Thr Tyr Cys Arg Ser Phe
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Tyr Pro Glu His Ser Ile Lys Glu Trp Leu Ile Gly Met Glu Leu Val
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Tyr Phe Leu Leu Ala Arg Ala Ile Ser Ala Ser Ser Asp Gln Glu Lys
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His Ser Ser Arg Lys Ile Ile Phe Ser Tyr Val Val Val Phe Leu Val
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Cys Trp Leu Pro Tyr His Val Ala Val Leu Leu Asp Ile Phe Ser Ile
        265                     270                 275

ctg cac tac atc cct ttc acc tgc cgg ctg gag cac gcc ctc ttc acg       1036
Leu His Tyr Ile Pro Phe Thr Cys Arg Leu Glu His Ala Leu Phe Thr
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gcc ctg cat gtc aca cag tgc ctg tcg ctg gtg cac tgc tgc gtc aac       1084
Ala Leu His Val Thr Gln Cys Leu Ser Leu Val His Cys Cys Val Asn
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Pro Val Leu Tyr Ser Phe Ile Asn Arg Asn Tyr Arg Tyr Glu Leu Met
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aag gcc ttc atc ttc aag tac tcg gcc aaa aca ggg ctc acc aag ctc       1180
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Ser Thr Lys
360

gaacagggtg atgggcccta tggttttcta gagcaaagca aagtagcttc gggtcttgat     1340

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Met Cys Pro Asn Met Pro Asn Lys Ser Val Leu Leu Tyr Thr Leu Ser
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Phe Ile Tyr Ile Phe Ile Phe Val Ile Gly Met Ile Ala Asn Ser Val
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Val Val Trp Val Asn Ile Gln Ala Lys Thr Thr Gly Tyr Asp Thr His
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Gly Glu Leu Thr Cys Lys Val Thr His Leu Ile Phe Ser Ile Asn Leu
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Phe Gly Ser Ile Phe Phe Leu Thr Cys Met Ser Val Asp Arg Tyr Leu
        130                 135                 140

Ser Ile Thr Tyr Phe Thr Asn Thr Pro Ser Ser Arg Lys Lys Met Val
145                 150                 155                 160

Arg Arg Val Val Cys Ile Leu Val Trp Leu Leu Ala Phe Cys Val Ser
                165                 170                 175

Leu Pro Asp Thr Tyr Tyr Leu Lys Thr Val Thr Ser Ala Ser Asn Asn
            180                 185                 190

Glu Thr Tyr Cys Arg Ser Phe Tyr Pro Glu His Ser Ile Lys Glu Trp
        195                 200                 205

Leu Ile Gly Met Glu Leu Val Ser Val Val Leu Gly Phe Ala Val Pro
    210                 215                 220

Phe Ser Ile Ile Ala Val Phe Tyr Phe Leu Leu Ala Arg Ala Ile Ser
225                 230                 235                 240

Ala Ser Ser Asp Gln Glu Lys His Ser Ser Arg Lys Ile Ile Phe Ser
            245                 250                 255

Tyr Val Val Val Phe Leu Val Cys Trp Leu Pro Tyr His Val Ala Val
            260                 265                 270

Leu Leu Asp Ile Phe Ser Ile Leu His Tyr Ile Pro Phe Thr Cys Arg
        275                 280                 285

Leu Glu His Ala Leu Phe Thr Ala Leu His Val Thr Gln Cys Leu Ser
    290                 295                 300

Leu Val His Cys Cys Val Asn Pro Val Leu Tyr Ser Phe Ile Asn Arg
305                 310                 315                 320

Asn Tyr Arg Tyr Glu Leu Met Lys Ala Phe Ile Phe Lys Tyr Ser Ala
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ctg ccg aga gtg ggc tgc ccc gcg ctg ccg ctg ccg ccg ccg ccg ctg    165
Leu Pro Arg Val Gly Cys Pro Ala Leu Pro Leu Pro Pro Pro Pro Leu
             5               10                  15

ctg ccg ctg ctg ctg ctg cta ctg ggc gcg agt ggc ggc ggc ggc ggg    213
Leu Pro Leu Leu Leu Leu Leu Leu Gly Ala Ser Gly Gly Gly Gly Gly
         20                  25                  30

gcg cgc gcg gag gtg ctg ttc cgc tgc ccg ccc tgc aca ccc gag cgc    261
Ala Arg Ala Glu Val Leu Phe Arg Cys Pro Pro Cys Thr Pro Glu Arg
     35                  40                  45

ctg gcc gcc tgc ggg ccc ccg ccg gtt gcg ccc ccc gcc gcg gtg gcc    309
Leu Ala Ala Cys Gly Pro Pro Pro Val Ala Pro Pro Ala Ala Val Ala
50                  55                  60                  65

gca gtg gcc gga ggc gcc cgc atg cca tgc gcg gag ctc gtc cgg gag    357
Ala Val Ala Gly Gly Ala Arg Met Pro Cys Ala Glu Leu Val Arg Glu
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ccg ggc tgc ggc tgc tgc tcg gtg tgc gcc cgg ctg gag ggc gag gcg    405
Pro Gly Cys Gly Cys Cys Ser Val Cys Ala Arg Leu Glu Gly Glu Ala
             85                  90                  95

tgc ggc gtc tac acc ccg cgc tgc ggc cag ggg ctg cgc tgc tat ccc    453
Cys Gly Val Tyr Thr Pro Arg Cys Gly Gln Gly Leu Arg Cys Tyr Pro
             100                 105                 110

cac ccg ggc tcc gag ctg ccc ctg cag gcg ctg gtc atg ggc gag ggc    501
His Pro Gly Ser Glu Leu Pro Leu Gln Ala Leu Val Met Gly Glu Gly
115                 120                 125

act tgt gag aag cgc cgg gac gcc gag tat ggc gcc agc ccg gag cag    549
Thr Cys Glu Lys Arg Arg Asp Ala Glu Tyr Gly Ala Ser Pro Glu Gln
130                 135                 140                 145

gtt gca gac aat ggc gat gac cac tca gaa gga ggc ctg gtg gag aac    597
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Page 5

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cac gtg gac agc acc atg aac atg ttg ggc ggg gga ggc agt gct ggc      645
His Val Asp Ser Thr Met Asn Met Leu Gly Gly Gly Gly Ser Ala Gly
            165                 170                 175

cgg aag ccc ctc aag tcg ggt atg aag gag ctg gcc gtg ttc cgg gag      693
Arg Lys Pro Leu Lys Ser Gly Met Lys Glu Leu Ala Val Phe Arg Glu
            180                 185                 190

aag gtc act gag cag cac cgg cag atg ggc aag ggt ggc aag cat cac      741
Lys Val Thr Glu Gln His Arg Gln Met Gly Lys Gly Gly Lys His His
            195                 200                 205

ctt ggc ctg gag gag ccc aag aag ctg cga cca ccc cct gcc agg act      789
Leu Gly Leu Glu Glu Pro Lys Lys Leu Arg Pro Pro Pro Ala Arg Thr
210                 215                 220                 225

ccc tgc caa cag gaa ctg gac cag gtc ctg gag cgg atc tcc acc atg      837
Pro Cys Gln Gln Glu Leu Asp Gln Val Leu Glu Arg Ile Ser Thr Met
                230                 235                 240

cgc ctt ccg gat gag cgg ggc cct ctg gag cac ctc tac tcc ctg cac      885
Arg Leu Pro Asp Glu Arg Gly Pro Leu Glu His Leu Tyr Ser Leu His
                245                 250                 255

atc ccc aac tgt gac aag cat ggc ctg tac aac ctc aaa cag tgc aag      933
Ile Pro Asn Cys Asp Lys His Gly Leu Tyr Asn Leu Lys Gln Cys Lys
                260                 265                 270

atg tct ctg aac ggg cag cgt ggg gag tgc tgg tgt gtg aac ccc aac      981
Met Ser Leu Asn Gly Gln Arg Gly Glu Cys Trp Cys Val Asn Pro Asn
            275                 280                 285

acc ggg aag ctg atc cag gga gcc ccc acc atc cgg ggg gac ccc gag      1029
Thr Gly Lys Leu Ile Gln Gly Ala Pro Thr Ile Arg Gly Asp Pro Glu
290                 295                 300                 305

tgt cat ctc ttc tac aat gag cag cag gag gct cgc ggg gtg cac acc      1077
Cys His Leu Phe Tyr Asn Glu Gln Gln Glu Ala Arg Gly Val His Thr
                310                 315                 320

cag cgg atg cag tag accgcagcca gccggtgcct ggcgcccctg ccccccgccc      1132
Gln Arg Met Gln
            325
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Gly Ala Arg Ala Glu Val Leu Phe Arg Cys Pro Pro Cys Thr Pro Glu
        35   40   45

Arg Leu Ala Ala Cys Gly Pro Pro Pro Val Ala Pro Pro Ala Ala Val
    50   55   60

Ala Ala Val Ala Gly Gly Ala Arg Met Pro Cys Ala Glu Leu Val Arg
65   70   75   80

Glu Pro Gly Cys Gly Cys Cys Ser Val Cys Ala Arg Leu Glu Gly Glu
                85   90   95

Ala Cys Gly Val Tyr Thr Pro Arg Cys Gly Gln Gly Leu Arg Cys Tyr
            100   105   110

Pro His Pro Gly Ser Glu Leu Pro Leu Gln Ala Leu Val Met Gly Glu
        115   120   125

Gly Thr Cys Glu Lys Arg Arg Asp Ala Glu Tyr Gly Ala Ser Pro Glu
    130   135   140

Gln Val Ala Asp Asn Gly Asp Asp His Ser Glu Gly Gly Leu Val Glu
145   150   155   160

Asn His Val Asp Ser Thr Met Asn Met Leu Gly Gly Gly Gly Ser Ala
            165   170   175

Gly Arg Lys Pro Leu Lys Ser Gly Met Lys Glu Leu Ala Val Phe Arg
            180   185   190

Glu Lys Val Thr Glu Gln His Arg Gln Met Gly Lys Gly Gly Lys His
        195   200   205

His Leu Gly Leu Glu Glu Pro Lys Lys Leu Arg Pro Pro Pro Ala Arg
    210   215   220

Thr Pro Cys Gln Gln Glu Leu Asp Gln Val Leu Glu Arg Ile Ser Thr
225   230   235   240

Met Arg Leu Pro Asp Glu Arg Gly Pro Leu Glu His Leu Tyr Ser Leu
                        Page 7

                245   250   255

His Ile Pro Asn Cys Asp Lys His Gly Leu Tyr Asn Leu Lys Gln Cys
            260   265   270

Lys Met Ser Leu Asn Gly Gln Arg Gly Glu Cys Trp Cys Val Asn Pro
        275   280   285

Asn Thr Gly Lys Leu Ile Gln Gly Ala Pro Thr Ile Arg Gly Asp Pro
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cgc cct ggc tgg ctg gcc ctg ctg ctg tgg gtc tca gcc ctg agc tgt   159
Arg Pro Gly Trp Leu Ala Leu Leu Leu Trp Val Ser Ala Leu Ser Cys
        15   20   25

tct ttc tcc ttg cca gct tct tcc ctt tct tct ctg gtg ccc caa gtc   207
Ser Phe Ser Leu Pro Ala Ser Ser Leu Ser Ser Leu Val Pro Gln Val
    30   35   40

aga acc agc tac aat ttt gga agg act ttc ctc ggt ctt gat aaa tgc   255
Arg Thr Ser Tyr Asn Phe Gly Arg Thr Phe Leu Gly Leu Asp Lys Cys
45   50   55   60

aat gcc tgc atc ggg aca tct att tgc aag aag ttc ttt aaa gaa gaa   303
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            65   70   75

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Ile Arg Ser Asp Asn Trp Leu Ala Ser His Leu Gly Leu Pro Pro Asp
        80   85   90

tcc ttg ctt tct tat cct gca aat tac tca gat gat tcc aaa atc tgg   399
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att gag cgt gtc ctg cgg aaa aca gag agg ttc cag aaa tgg ctg cag      543
Ile Glu Arg Val Leu Arg Lys Thr Glu Arg Phe Gln Lys Trp Leu Gln
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gcc aag cgc ctc acg ccg gac ctg gtg cag gac tgt cac cag ggc cag      591
Ala Lys Arg Leu Thr Pro Asp Leu Val Gln Asp Cys His Gln Gly Gln
            160                 165                 170

aga gaa cta aag ttc ctg tgt atg ctg aga taa caccagtgaa aaagcctggc   644
Arg Glu Leu Lys Phe Leu Cys Met Leu Arg
            175                 180
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Gly Thr Ser Ile Cys Lys Lys Phe Phe Lys Glu Glu Ile Arg Ser Asp
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Ile Phe Arg Leu Val Ser Lys Tyr Gln Asn Glu Ile Ser Asp Arg Lys
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                                            Met Ser Lys Leu
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aca tta tcc gaa ggc cat ccg gaa acg cca gtt gat ggg gac cta ggg      222
Thr Leu Ser Glu Gly His Pro Glu Thr Pro Val Asp Gly Asp Leu Gly
 5               10              15              20

aag caa gat atc tgc tca tct gaa gcc tcg tgg ggt gat ttt gaa tat      270
Lys Gln Asp Ile Cys Ser Ser Glu Ala Ser Trp Gly Asp Phe Glu Tyr
                25              30              35

gat gta atg ggc cag aat atc gat gaa gat tta ctg aga gag cct gaa      318
Asp Val Met Gly Gln Asn Ile Asp Glu Asp Leu Leu Arg Glu Pro Glu
            40              45              50

cac ttc ctg tat ggt ggt gac cct cct ttg gag gaa gat tct ctg aag      366
His Phe Leu Tyr Gly Gly Asp Pro Pro Leu Glu Glu Asp Ser Leu Lys
        55              60              65

cag tcg ctg gca ccg tac aca cct ccc ttt gat ttg tct tat ctc aca      414
Gln Ser Leu Ala Pro Tyr Thr Pro Pro Phe Asp Leu Ser Tyr Leu Thr
    70              75              80

gaa cct gcc cag agt gct gaa aca ata gag gaa gct ggg tct cca gag      462
Glu Pro Ala Gln Ser Ala Glu Thr Ile Glu Glu Ala Gly Ser Pro Glu
85              90              95              100

gat gaa tct ctg gga tgc aga gca gca gag ata gtg ctt tct gca ctt      510
Asp Glu Ser Leu Gly Cys Arg Ala Ala Glu Ile Val Leu Ser Ala Leu
            105             110             115

cct gat cga aga agt gag gga aac cag gct gag acc aaa aac aga ctg      558
Pro Asp Arg Arg Ser Glu Gly Asn Gln Ala Glu Thr Lys Asn Arg Leu
            120             125             130
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49321-111.ST25.txt

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cct gga tcc cag ctg gct gtg ctg cat att cgt gaa gac cct gag tcc    606
Pro Gly Ser Gln Leu Ala Val Leu His Ile Arg Glu Asp Pro Glu Ser
        135             140             145

gtt tat ttg ccg gta gga gca ggc tcc aac att ttg tct cca tca aac    654
Val Tyr Leu Pro Val Gly Ala Gly Ser Asn Ile Leu Ser Pro Ser Asn
        150             155             160

gtt gac tgg gaa gta gaa aca gat aat tct gat tta cca gca ggt gga    702
Val Asp Trp Glu Val Glu Thr Asp Asn Ser Asp Leu Pro Ala Gly Gly
165             170             175             180

gac ata gga cca cca aat ggt gcc agc aag gaa ata tca gaa ttg gaa    750
Asp Ile Gly Pro Pro Asn Gly Ala Ser Lys Glu Ile Ser Glu Leu Glu
                185             190             195

gaa gaa aaa aca att cct acc aaa gag cct gag cag ata aaa tca gaa    798
Glu Glu Lys Thr Ile Pro Thr Lys Glu Pro Glu Gln Ile Lys Ser Glu
        200             205             210

tac aag gaa gaa aga tgt aca gag aag aat gaa gat cgt cat gca cta    846
Tyr Lys Glu Glu Arg Cys Thr Glu Lys Asn Glu Asp Arg His Ala Leu
        215             220             225

cac atg gat tac ata ctt gta aac cgt gaa gaa aat tca cac tca aag    894
His Met Asp Tyr Ile Leu Val Asn Arg Glu Glu Asn Ser His Ser Lys
    230             235             240

cca gag acc tgt gaa gaa aga gaa agc ata gct gaa tta gaa ttg tat    942
Pro Glu Thr Cys Glu Glu Arg Glu Ser Ile Ala Glu Leu Glu Leu Tyr
245             250             255             260

gta ggt tcc aaa gaa aca ggg ctg cag gga act cag tta gca agc ttc    990
Val Gly Ser Lys Glu Thr Gly Leu Gln Gly Thr Gln Leu Ala Ser Phe
            265             270             275

cca gac aca tgt cag cca gcc tcc tta aat gaa aga aaa ggt ctc tct   1038
Pro Asp Thr Cys Gln Pro Ala Ser Leu Asn Glu Arg Lys Gly Leu Ser
            280             285             290

gca gag aaa atg tct tct aaa agc gat acg aga tca tct ttt gaa agc   1086
Ala Glu Lys Met Ser Ser Lys Ser Asp Thr Arg Ser Ser Phe Glu Ser
        295             300             305

cct gca caa gac cag agt tgg atg ttc ttg ggc cat agt gag gtt ggt   1134
Pro Ala Gln Asp Gln Ser Trp Met Phe Leu Gly His Ser Glu Val Gly
    310             315             320

gat cca tca ctg gat gcc agg gac tca ggg cct ggg tgg tct ggc aag   1182
Asp Pro Ser Leu Asp Ala Arg Asp Ser Gly Pro Gly Trp Ser Gly Lys
325             330             335             340

act gtg gag ccg ttc tct gaa ctc ggc ttg ggt gag ggt ccc cag ctg   1230
Thr Val Glu Pro Phe Ser Glu Leu Gly Leu Gly Glu Gly Pro Gln Leu
            345             350             355

cag att ctg gaa gaa atg aag cct cta gaa tct ttg gca cta gag gaa   1278
Gln Ile Leu Glu Glu Met Lys Pro Leu Glu Ser Leu Ala Leu Glu Glu
            360             365             370

gcc tct ggt cca gtc agc caa tca cag aag agt aag agc cga ggc agg   1326
Ala Ser Gly Pro Val Ser Gln Ser Gln Lys Ser Lys Ser Arg Gly Arg
```

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49321-111.ST25.txt
         375   380   385

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gct ggc ccg gat gca gtt acg ttg cag gct gtc acc cat gac aat gaa    1374
Ala Gly Pro Asp Ala Val Thr Leu Gln Ala Val Thr His Asp Asn Glu
    390             395                 400

tgg gaa atg ctt tca cca cag cct gtt cag aaa aac atg atc cct gac    1422
Trp Glu Met Leu Ser Pro Gln Pro Val Gln Lys Asn Met Ile Pro Asp
405                 410                 415                 420

acg gaa atg gag gag gag aca gag ttc ctt gag ctc gga acc agg ata    1470
Thr Glu Met Glu Glu Glu Thr Glu Phe Leu Glu Leu Gly Thr Arg Ile
            425                 430                 435

tca aga cca aat gga cta ctg tca gag gat gta gga atg gac atc ccc    1518
Ser Arg Pro Asn Gly Leu Leu Ser Glu Asp Val Gly Met Asp Ile Pro
        440                 445                 450

ttt gaa gag ggc gtg ctg agt ccc agt gct gca gac atg agg cct gaa    1566
Phe Glu Glu Gly Val Leu Ser Pro Ser Ala Ala Asp Met Arg Pro Glu
        455                 460                 465

cct cct aat tct ctg gat ctt aat gac act cat cct cgg aga atc aag    1614
Pro Pro Asn Ser Leu Asp Leu Asn Asp Thr His Pro Arg Arg Ile Lys
        470                 475                 480

ctc aca gcc cca aat atc aat ctt tct ctg gac caa agt gaa gga tct    1662
Leu Thr Ala Pro Asn Ile Asn Leu Ser Leu Asp Gln Ser Glu Gly Ser
485                 490                 495                 500

att ctc tct gat gat aac ttg gac agt cca gat gaa att gac atc aat    1710
Ile Leu Ser Asp Asp Asn Leu Asp Ser Pro Asp Glu Ile Asp Ile Asn
            505                 510                 515

gtg gat gaa ctt gat acc ccc gat gaa gca gat tct ttt gag tac act    1758
Val Asp Glu Leu Asp Thr Pro Asp Glu Ala Asp Ser Phe Glu Tyr Thr
        520                 525                 530

ggc cat gat ccc aca gcc aac aaa gat tct ggc caa gag tca gag tct    1806
Gly His Asp Pro Thr Ala Asn Lys Asp Ser Gly Gln Glu Ser Glu Ser
        535                 540                 545

att cca gaa tat acg gcc gaa gag gaa cgg gag gac aac cgg ctt tgg    1854
Ile Pro Glu Tyr Thr Ala Glu Glu Glu Arg Glu Asp Asn Arg Leu Trp
550                 555                 560

agg aca gtg gtc att gga gaa caa gag cag cgc att gac atg aag gtc    1902
Arg Thr Val Val Ile Gly Glu Gln Glu Gln Arg Ile Asp Met Lys Val
565                 570                 575                 580

atc gag ccc tac agg aga gtc att tct cac gga gga tac tat ggg gac    1950
Ile Glu Pro Tyr Arg Arg Val Ile Ser His Gly Gly Tyr Tyr Gly Asp
                585                 590                 595

ggt cta aat gcc atc att gtg ttt gcc gcc tgt ttt ctg cca gac agc    1998
Gly Leu Asn Ala Ile Ile Val Phe Ala Ala Cys Phe Leu Pro Asp Ser
            600                 605                 610

agt cgg gcg gat tac cac tat gtc atg gaa aat ctt ttc cta tat gta    2046
Ser Arg Ala Asp Tyr His Tyr Val Met Glu Asn Leu Phe Leu Tyr Val
        615                 620                 625

ata agt act tta gag ttg atg gta gct gaa gac tat atg att gtg tac    2094
```
                            Page 13

49321-111.ST25.txt
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Ile Ser Thr Leu Glu Leu Met Val Ala Glu Asp Tyr Met Ile Val Tyr
    630             635             640

ttg aat ggt gca acc cca aga agg agg atg cca ggg cta ggc tgg atg   2142
Leu Asn Gly Ala Thr Pro Arg Arg Arg Met Pro Gly Leu Gly Trp Met
645             650             655             660

aag aaa tgc tac cag atg att gac aga cgg ttg agg aag aat ttg aaa   2190
Lys Lys Cys Tyr Gln Met Ile Asp Arg Arg Leu Arg Lys Asn Leu Lys
                665             670             675

tca ttc atc att gtt cat cca tct tgg ttc atc aga aca atc ctt gct   2238
Ser Phe Ile Ile Val His Pro Ser Trp Phe Ile Arg Thr Ile Leu Ala
            680             685             690

gtg aca cga cct ttt ata agt tca aaa ttc agc agt aaa att aaa tat   2286
Val Thr Arg Pro Phe Ile Ser Ser Lys Phe Ser Ser Lys Ile Lys Tyr
        695             700             705

gtc aat agc tta tca gaa ctc agt ggg ctg atc cca atg gat tgc atc   2334
Val Asn Ser Leu Ser Glu Leu Ser Gly Leu Ile Pro Met Asp Cys Ile
    710             715             720

cac att cca gag agc atc atc aaa ctg gat gaa gaa ctg agg gaa gca   2382
His Ile Pro Glu Ser Ile Ile Lys Leu Asp Glu Glu Leu Arg Glu Ala
725             730             735             740

tca gag gca gct aaa act agc tgc ctt tac aat gat cca gaa atg tct   2430
Ser Glu Ala Ala Lys Thr Ser Cys Leu Tyr Asn Asp Pro Glu Met Ser
            745             750             755

tct atg gag aag gat att gac ttg aag ctg aaa gaa aag cct tag       2475
Ser Met Glu Lys Asp Ile Asp Leu Lys Leu Lys Glu Lys Pro
            760             765             770

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cctgaaagag acagggctga tgttaccttt ttccactttg cactacctgg tgccattcta   2595

aatttctaag gggaaaaata gaaagtttgt ttactcttaa gatattttat gaaattgtgt   2655

gtactttcct attttgccaa ttatgtgcct caaagatttt agttgagcct tagcaagaaa   2715

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gctctctgag tttcaggcca taaactcagc tccagaggtt accttttaag tgccaagaac   3255

tcaagtgcaa ggtggcctac tcaaaaatca tttggtagca ttcagttatt catgaattcc   3315
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49321-111.ST25.txt

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49321-111.ST25.txt

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gtgcacaaat taatctttta tatatctaaa ggtttttcta tcatgcattg gattgctcag   5535

aataaagtgt ctgttagact tcgttttggt aaataaattc tccataatgt agattaataa   5595

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Gly Asp Leu Gly Lys Gln Asp Ile Cys Ser Ser Glu Ala Ser Trp Gly
                20                  25                  30


Asp Phe Glu Tyr Asp Val Met Gly Gln Asn Ile Asp Glu Asp Leu Leu
            35                  40                  45


Arg Glu Pro Glu His Phe Leu Tyr Gly Gly Asp Pro Pro Leu Glu Glu
        50                  55                  60


Asp Ser Leu Lys Gln Ser Leu Ala Pro Tyr Thr Pro Pro Phe Asp Leu
65                  70                  75                  80


Ser Tyr Leu Thr Glu Pro Ala Gln Ser Ala Glu Thr Ile Glu Glu Ala
                85                  90                  95


Gly Ser Pro Glu Asp Glu Ser Leu Gly Cys Arg Ala Ala Glu Ile Val
                100                 105                 110


Leu Ser Ala Leu Pro Asp Arg Arg Ser Glu Gly Asn Gln Ala Glu Thr
        115                 120                 125


Lys Asn Arg Leu Pro Gly Ser Gln Leu Ala Val Leu His Ile Arg Glu
    130                 135                 140


Asp Pro Glu Ser Val Tyr Leu Pro Val Gly Ala Gly Ser Asn Ile Leu
145                 150                 155                 160
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49321-111.ST25.txt

Ser Pro Ser Asn Val Asp Trp Glu Val Glu Thr Asp Asn Ser Asp Leu
                  165   170   175

Pro Ala Gly Gly Asp Ile Gly Pro Pro Asn Gly Ala Ser Lys Glu Ile
              180   185   190

Ser Glu Leu Glu Glu Glu Lys Thr Ile Pro Thr Lys Glu Pro Glu Gln
          195   200   205

Ile Lys Ser Glu Tyr Lys Glu Glu Arg Cys Thr Glu Lys Asn Glu Asp
    210   215   220

Arg His Ala Leu His Met Asp Tyr Ile Leu Val Asn Arg Glu Glu Asn
225   230   235   240

Ser His Ser Lys Pro Glu Thr Cys Glu Glu Arg Glu Ser Ile Ala Glu
              245   250   255

Leu Glu Leu Tyr Val Gly Ser Lys Glu Thr Gly Leu Gln Gly Thr Gln
              260   265   270

Leu Ala Ser Phe Pro Asp Thr Cys Gln Pro Ala Ser Leu Asn Glu Arg
          275   280   285

Lys Gly Leu Ser Ala Glu Lys Met Ser Ser Lys Ser Asp Thr Arg Ser
    290   295   300

Ser Phe Glu Ser Pro Ala Gln Asp Gln Ser Trp Met Phe Leu Gly His
305   310   315   320

Ser Glu Val Gly Asp Pro Ser Leu Asp Ala Arg Asp Ser Gly Pro Gly
              325   330   335

Trp Ser Gly Lys Thr Val Glu Pro Phe Ser Glu Leu Gly Leu Gly Glu
              340   345   350

Gly Pro Gln Leu Gln Ile Leu Glu Glu Met Lys Pro Leu Glu Ser Leu
          355   360   365

Ala Leu Glu Glu Ala Ser Gly Pro Val Ser Gln Ser Gln Lys Ser Lys
    370   375   380

Ser Arg Gly Arg Ala Gly Pro Asp Ala Val Thr Leu Gln Ala Val Thr
385   390   395   400

His Asp Asn Glu Trp Glu Met Leu Ser Pro Gln Pro Val Gln Lys Asn
                              Page 17

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                                49321-111.9T25.txt
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Met Ile Pro Asp Thr Glu Met Glu Glu Glu Thr Glu Phe Leu Glu Leu
             420                     425                  430


Gly Thr Arg Ile Ser Arg Pro Asn Gly Leu Leu Ser Glu Asp Val Gly
             435                 440                  445

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Met Asp Ile Pro Phe Glu Glu Gly Val Leu Ser Pro Ser Ala Ala Asp
    450              .       455                  460


Met Arg Pro Glu Pro Pro Asn Ser Leu Asp Leu Asn Asp Thr His Pro
465                  470                  475                  480


Arg Arg Ile Lys Leu Thr Ala Pro Asn Ile Asn Leu Ser Leu Asp Gln
             485     .           490                      495


Ser Glu Gly Ser Ile Leu Ser Asp Asp Asn Leu Asp Ser Pro Asp Glu
             500                 505                  510


Ile Asp Ile Asn Val Asp Glu Leu Asp Thr Pro Asp Glu Ala Asp Ser
             515                 520                  525


                                    .
Phe Glu Tyr Thr Gly His Asp Pro Thr Ala Asn Lys Asp Ser Gly Gln
    530      .           535                  540


Glu Ser Glu Ser Ile Pro Glu Tyr Thr Ala Glu Glu Glu Arg Glu Asp
545                  550                  555                  560


Asn Arg Leu Trp Arg Thr Val Val Ile Gly Glu Gln Glu Gln Arg Ile
             565                 570                  575


Asp Met Lys Val Ile Glu Pro Tyr Arg Arg Val Ile Ser His Gly Gly
             580                 585                  590


Tyr Tyr Gly Asp Gly Leu Asn Ala Ile Ile Val Phe Ala Ala Cys Phe
    595                 600                  605


Leu Pro Asp Ser Ser Arg Ala Asp Tyr His Tyr Val Met Glu Asn Leu
    610                 615                  620


Phe Leu Tyr Val Ile Ser Thr Leu Glu Leu Met Val Ala Glu Asp Tyr
625              630                  635                  640


Met Ile Val Tyr Leu Asn Gly Ala Thr Pro Arg Arg Arg Met Pro Gly
             645                 650                  655
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                                    Page 18

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Leu Gly Trp Met Lys Lys Cys Tyr Gln Met Ile Asp Arg Arg Leu Arg
            660              665              670


Lys Asn Leu Lys Ser Phe Ile Ile Val His Pro Ser Trp Phe Ile Arg
            675              680              685


Thr Ile Leu Ala Val Thr Arg Pro Phe Ile Ser Ser Lys Phe Ser Ser
    690              695              700


Lys Ile Lys Tyr Val Asn Ser Leu Ser Glu Leu Ser Gly Leu Ile Pro
705              710              715              720


Met Asp Cys Ile His Ile Pro Glu Ser Ile Ile Lys Leu Asp Glu Glu
            725              730              735


Leu Arg Glu Ala Ser Glu Ala Ala Lys Thr Ser Cys Leu Tyr Asn Asp
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Pro Glu Met Ser Ser Met Glu Lys Asp Ile Asp Leu Lys Leu Lys Glu
            755              760              765


Lys Pro
    770



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                                                      Met Gly Leu
                                                        1

aag ttg aac ggc aga tat att tca ctg atc ctc gcg gtg caa ata gcg      225
Lys Leu Asn Gly Arg Tyr Ile Ser Leu Ile Leu Ala Val Gln Ile Ala
    5               10              15

tat ctg gtg cag gcc gtg aga gca gcg ggc aag tgc gat gcg gtc ttc      273
Tyr Leu Val Gln Ala Val Arg Ala Ala Gly Lys Cys Asp Ala Val Phe
20              25              30              35

aag ggc ttt tcg gac tgt ttg ctc aag ctg ggc gac agc atg gcc aac      321
Lys Gly Phe Ser Asp Cys Leu Leu Lys Leu Gly Asp Ser Met Ala Asn
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49321-111.ST25.txt

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tac tgg gag gat ttc cac agc tgc acg gtc aca gcc ctt acg gat tgc .      417
Tyr Trp Glu Asp Phe His Ser Cys Thr Val Thr Ala Leu Thr Asp Cys
        70              75                  80

cag gaa ggg gcg aaa gat atg tgg gat aaa ctg aga aaa gaa tcc aaa       465
Gln Glu Gly Ala Lys Asp Met Trp Asp Lys Leu Arg Lys Glu Ser Lys
        85                  90              95

aac ctc aac atc caa ggc agc tta ttc gaa ctc tgc ggc agc ggc aac       513
Asn Leu Asn Ile Gln Gly Ser Leu Phe Glu Leu Cys Gly Ser Gly Asn
100                 105                 110                 115

ggg gcg gcg ggg tcc ctg ctc ccg gcg ttc ccg gtg ctc ctg gtg tct       561
Gly Ala Ala Gly Ser Leu Leu Pro Ala Phe Pro Val Leu Leu Val Ser
                120                 125                 130

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Leu Ser Ala Ala Leu Ala Thr Trp Leu Ser Phe
                135                 140
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ctccctcttg ttttagctgt tacacacaca gtaatacctg aatatccaac ggtatagatc      1387

acaaggggg gatgttaaat gttaatctaa aatatagcta aaaaaagatt ttgacataaa       1447

agagccttga ttttaaaaaa aaaagagaga gagatgtaat ttaaaaagtt tattataaat     1507

taaattcagc aaaaaaagat ttgctacaaa gtatagagaa gtataaaata aaagttattg      1567

tttgaaaaaa aaaaaaaaaa aa                                              1589
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<210>   10
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<212>   PRT
<213>   Homo sapiens
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49321-111.ST25.txt

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<400>  10

    Met Gly Leu Lys Leu Asn Gly Arg Tyr Ile Ser Leu Ile Leu Ala Val
    1               5                   10                  15


    Gln Ile Ala Tyr Leu Val Gln Ala Val Arg Ala Ala Gly Lys Cys Asp
                    20                  25                  30


    Ala Val Phe Lys Gly Phe Ser Asp Cys Leu Leu Lys Leu Gly Asp Ser
                35                  40                  45


    Met Ala Asn Tyr Pro Gln Gly Leu Asp Asp Lys Thr Asn Ile Lys Thr
        50                  55                  60


    Val Cys Thr Tyr Trp Glu Asp Phe His Ser Cys Thr Val Thr Ala Leu
    65                  70                  75                  80


    Thr Asp Cys Gln Glu Gly Ala Lys Asp Met Trp Asp Lys Leu Arg Lys
                    85                  90                  95


    Glu Ser Lys Asn Leu Asn Ile Gln Gly Ser Leu Phe Glu Leu Cys Gly
                    100                 105                 110


    Ser Gly Asn Gly Ala Ala Gly Ser Leu Leu Pro Ala Phe Pro Val Leu
                    115                 120                 125


    Leu Val Ser Leu Ser Ala Ala Leu Ala Thr Trp Leu Ser Phe
        130                 135                 140


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<212>  DNA
<213>  Homo sapiens


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                                                       Met Gly Thr
                                                       1

ggg ggc cgg cgg ggg gcg gcg gcc gcg ccg ctg ctg gtg gcg gtg gcc      105
Gly Gly Arg Arg Gly Ala Ala Ala Ala Pro Leu Leu Val Ala Val Ala
    5                   10                  15

gcg ctg cta ctg ggc gcc gcg ggc cac ctg tac ccc gga gag gtg tgt      153
Ala Leu Leu Leu Gly Ala Ala Gly His Leu Tyr Pro Gly Glu Val Cys
20                  25                  30                  35

ccc ggc atg gat atc cgg aac aac ctc act agg ttg cat gag ctg gag      201
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```
                                    49321-111.ST25.txt
Pro Gly Met Asp Ile Arg Asn Asn Leu Thr Arg Leu His Glu Leu Glu
            40                  45                  50

aat tgc tct gtc atc gaa gga cac ttg cag ata ctc ttg atg ttc aaa      249
Asn Cys Ser Val Ile Glu Gly His Leu Gln Ile Leu Leu Met Phe Lys
            55                  60                  65

acg agg ccc gaa gat ttc cga gac ctc agt ttc ccc aaa ctc atc atg      297
Thr Arg Pro Glu Asp Phe Arg Asp Leu Ser Phe Pro Lys Leu Ile Met
            70                  75                  80

atc act gat tac ttg ctg ctc ttc cgg gtc tat ggg ctc gag agc ctg      345
Ile Thr Asp Tyr Leu Leu Leu Phe Arg Val Tyr Gly Leu Glu Ser Leu
            85                  90                  95

aag gac ctg ttc ccc aac ctc acg gtc atc cgg gga tca cga ctg ttc      393
Lys Asp Leu Phe Pro Asn Leu Thr Val Ile Arg Gly Ser Arg Leu Phe
100                 105                 110                 115

ttt aac tac gcg ctg gtc atc ttc gag atg gtt cac ctc aag gaa ctc      441
Phe Asn Tyr Ala Leu Val Ile Phe Glu Met Val His Leu Lys Glu Leu
            120                 125                 130

ggc ctc tac aac ctg atg aac atc acc cgg ggt tct gtc cgc atc gag      489
Gly Leu Tyr Asn Leu Met Asn Ile Thr Arg Gly Ser Val Arg Ile Glu
            135                 140                 145

aag aac aat gag ctc tgt tac ttg gcc act atc gac tgg tcc cgt atc      537
Lys Asn Asn Glu Leu Cys Tyr Leu Ala Thr Ile Asp Trp Ser Arg Ile
            150                 155                 160

ctg gat tcc gtg gag gat aat tac atc gtg ttg aac aaa gat gac aac      585
Leu Asp Ser Val Glu Asp Asn Tyr Ile Val Leu Asn Lys Asp Asp Asn
            165                 170                 175

gag gag tgt gga gac atc tgt ccg ggt acc gcg aag ggc aag acc aac      633
Glu Glu Cys Gly Asp Ile Cys Pro Gly Thr Ala Lys Gly Lys Thr Asn
180                 185                 190                 195

tgc ccc gcc acc gtc atc aac ggg cag ttt gtc gaa cga tgt tgg act      681
Cys Pro Ala Thr Val Ile Asn Gly Gln Phe Val Glu Arg Cys Trp Thr
            200                 205                 210

cat agt cac tgc cag aaa gtt tgc ccg acc atc tgt aag tca cac ggc      729
His Ser His Cys Gln Lys Val Cys Pro Thr Ile Cys Lys Ser His Gly
            215                 220                 225

tgc acc gcc gaa ggc ctc tgt tgc cac agc gag tgc ctg ggc aac tgt      777
Cys Thr Ala Glu Gly Leu Cys Cys His Ser Glu Cys Leu Gly Asn Cys
            230                 235                 240

tct cag ccc gac gac ccc acc aag tgc gtg gcc tgc cgc aac ttc tac      825
Ser Gln Pro Asp Asp Pro Thr Lys Cys Val Ala Cys Arg Asn Phe Tyr
            245                 250                 255

ctg gac ggc agg tgt gtg gag acc tgc ccg ccc ccg tac tac cac ttc      873
Leu Asp Gly Arg Cys Val Glu Thr Cys Pro Pro Pro Tyr Tyr His Phe
260                 265                 270                 275

cag gac tgg cgc tgt gtg aac ttc agc ttc tgc cag gac ctg cac cac      921
Gln Asp Trp Arg Cys Val Asn Phe Ser Phe Cys Gln Asp Leu His His
            280                 285                 290
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                                    49321-111.ST25.txt
aaa tgc aag aac tcg cgg agg cag ggc tgc cac cag tac gtc att cac        969
Lys Cys Lys Asn Ser Arg Arg Gln Gly Cys His Gln Tyr Val Ile His
            295                 300                 305

aac aac aag tgc atc cct gag tgt ccc tcc ggg tac acg atg aat tcc       1017
Asn Asn Lys Cys Ile Pro Glu Cys Pro Ser Gly Tyr Thr Met Asn Ser
            310                 315                 320

agc aac ttg ctg tgc acc cca tgc ctg ggt ccc tgt ccc aag gtg tgc      1065
Ser Asn Leu Leu Cys Thr Pro Cys Leu Gly Pro Cys Pro Lys Val Cys
            325                 330                 335

cac ctc cta gaa ggc gag aag acc atc gac tcg gtg acg tct gcc cag      1113
His Leu Leu Glu Gly Glu Lys Thr Ile Asp Ser Val Thr Ser Ala Gln
340                 345                 350                 355

gag ctc cga gga tgc acc gtc atc aac ggg agt ctg atc atc aac att      1161
Glu Leu Arg Gly Cys Thr Val Ile Asn Gly Ser Leu Ile Ile Asn Ile
                    360                 365                 370

cga gga ggc aac aat ctg gca gct gag cta gaa gcc aac ctc ggc ctc      1209
Arg Gly Gly Asn Asn Leu Ala Ala Glu Leu Glu Ala Asn Leu Gly Leu
            375                 380                 385

att gaa gaa att tca ggg tat cta aaa atc cgc cga tcc tac gct ctg      1257
Ile Glu Glu Ile Ser Gly Tyr Leu Lys Ile Arg Arg Ser Tyr Ala Leu
            390                 395                 400

gtg tca ctt tcc ttc ttc cgg aag tta cgt ctg att cga gga gag acc      1305
Val Ser Leu Ser Phe Phe Arg Lys Leu Arg Leu Ile Arg Gly Glu Thr
            405                 410                 415

ttg gaa att ggg aac tac tcc ttc tat gcc ttg gac aac cag aac cta      1353
Leu Glu Ile Gly Asn Tyr Ser Phe Tyr Ala Leu Asp Asn Gln Asn Leu
420                 425                 430                 435

agg cag ctc tgg gac tgg agc aaa cac aac ctc acc atc act cag ggg      1401
Arg Gln Leu Trp Asp Trp Ser Lys His Asn Leu Thr Ile Thr Gln Gly
                    440                 445                 450

aaa ctc ttc ttc cac tat aac ccc aaa ctc tgc ttg tca gaa atc cac      1449
Lys Leu Phe Phe His Tyr Asn Pro Lys Leu Cys Leu Ser Glu Ile His
                    455                 460                 465

aag atg gaa gaa gtt tca gga acc aag ggg cgc cag gag aga aac gac      1497
Lys Met Glu Glu Val Ser Gly Thr Lys Gly Arg Gln Glu Arg Asn Asp
            470                 475                 480

att gcc ctg aag acc aat ggg gac cag gca tcc tgt gaa aat gag tta      1545
Ile Ala Leu Lys Thr Asn Gly Asp Gln Ala Ser Cys Glu Asn Glu Leu
            485                 490                 495

ctt aaa ttt tct tac att cgg aca tct ttt gac aag atc ttg ctg aga      1593
Leu Lys Phe Ser Tyr Ile Arg Thr Ser Phe Asp Lys Ile Leu Leu Arg
500                 505                 510                 515

tgg gag ccg tac tgg ccc ccc gac ttc cga gac ctc ttg ggg ttc atg      1641
Trp Glu Pro Tyr Trp Pro Pro Asp Phe Arg Asp Leu Leu Gly Phe Met
                    520                 525                 530

ctg ttc tac aaa gag gcc cct tat cag aat gtg acg gag ttc gac ggg      1689
Leu Phe Tyr Lys Glu Ala Pro Tyr Gln Asn Val Thr Glu Phe Asp Gly
            535                 540                 545
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49321-111.ST25.txt

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cag gat gca tgt ggt tcc aac agt tgg acg gtg gta gac att gac cca      1737
Gln Asp Ala Cys Gly Ser Asn Ser Trp Thr Val Val Asp Ile Asp Pro
        550               555               560

ccc ctg agg tcc aac gac ccc aaa tca cag aac cac cca ggg tgg ctg      1785
Pro Leu Arg Ser Asn Asp Pro Lys Ser Gln Asn His Pro Gly Trp Leu
        565               570               575

atg cgg ggt ctc aag ccc tgg acc cag tat gcc atc ttt gtg aag acc      1833
Met Arg Gly Leu Lys Pro Trp Thr Gln Tyr Ala Ile Phe Val Lys Thr
580               585               590               595

ctg gtc acc ttt tcg gat gaa cgc cgg acc tat ggg gcc aag agt gac      1881
Leu Val Thr Phe Ser Asp Glu Arg Arg Thr Tyr Gly Ala Lys Ser Asp
                600               605               610

atc att tat gtc cag aca gat gcc acc aac ccc tct gtg ccc ctg gat      1929
Ile Ile Tyr Val Gln Thr Asp Ala Thr Asn Pro Ser Val Pro Leu Asp
            615               620               625

cca atc tca gtg tct aac tca tca tcc cag att att ctg aag tgg aaa      1977
Pro Ile Ser Val Ser Asn Ser Ser Ser Gln Ile Ile Leu Lys Trp Lys
        630               635               640

cca ccc tcc gac ccc aat ggc aac atc acc cac tac ctg gtt ttc tgg      2025
Pro Pro Ser Asp Pro Asn Gly Asn Ile Thr His Tyr Leu Val Phe Trp
        645               650               655

gag agg cag gcg gaa gac agt gag ctg ttc gag ctg gat tat tgc ctc   ·  2073
Glu Arg Gln Ala Glu Asp Ser Glu Leu Phe Glu Leu Asp Tyr Cys Leu
660               665               670               675

aaa ggg ctg aag ctg ccc tcg agg acc tgg tct cca cca ttc gag tct      2121
Lys Gly Leu Lys Leu Pro Ser Arg Thr Trp Ser Pro Pro Phe Glu Ser
                680               685               690

gaa gat tct cag aag cac aac cag agt gag tat gag gat tcg gcc ggc      2169
Glu Asp Ser Gln Lys His Asn Gln Ser Glu Tyr Glu Asp Ser Ala Gly
            695               700               705

gaa tgc tgc tcc tgt cca aag aca gac tct cag atc ctg aag gag ctg      2217
Glu Cys Cys Ser Cys Pro Lys Thr Asp Ser Gln Ile Leu Lys Glu Leu
        710               715               720

gag gag tcc tcg ttt agg aag acg ttt gag gat tac ctg cac aac gtg      2265
Glu Glu Ser Ser Phe Arg Lys Thr Phe Glu Asp Tyr Leu His Asn Val
        725               730               735

gtt ttc gtc ccc agg cca tct cgg aaa cgc agg tcc ctt ggc gat gtt      2313
Val Phe Val Pro Arg Pro Ser Arg Lys Arg Arg Ser Leu Gly Asp Val
740               745               750               755

ggg aat gtg acg gtg gcc gtg ccc acg gtg gca gct ttc ccc aac act      2361
Gly Asn Val Thr Val Ala Val Pro Thr Val Ala Ala Phe Pro Asn Thr
                760               765               770

tcc tcg acc agc gtg ccc acg agt ccg gag gag cac agg cct ttt gag      2409
Ser Ser Thr Ser Val Pro Thr Ser Pro Glu Glu His Arg Pro Phe Glu
            775               780               785

aag gtg gtg aac aag gag tcg ctg gtc atc tcc ggc ttg cga cac ttc      2457
Lys Val Val Asn Lys Glu Ser Leu Val Ile Ser Gly Leu Arg His Phe
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                                          49321-111.ST25.txt
         790                     795                      800

acg ggc tat cgc atc gag ctg cag gct tgc aac cag gac acc cct gag    2505
Thr Gly Tyr Arg Ile Glu Leu Gln Ala Cys Asn Gln Asp Thr Pro Glu
    805                     810                  815

gaa cgg tgc agt gtg gca gcc tac gtc agt gcg agg acc atg cct gaa    2553
Glu Arg Cys Ser Val Ala Ala Tyr Val Ser Ala Arg Thr Met Pro Glu
820                     825                  830                835

gcc aag gct gat gac att gtt ggc cct gtg acg cat gaa atc ttt gag    2601
Ala Lys Ala Asp Asp Ile Val Gly Pro Val Thr His Glu Ile Phe Glu
                    840                  845              850

aac aac gtc gtc cac ttg atg tgg cag gag ccg aag gag ccc aat ggt    2649
Asn Asn Val Val His Leu Met Trp Gln Glu Pro Lys Glu Pro Asn Gly
                855                  860              865

ctg atc gtg ctg tat gaa gtg agt tat cgg cga tat ggt gat gag gag    2697
Leu Ile Val Leu Tyr Glu Val Ser Tyr Arg Arg Tyr Gly Asp Glu Glu
            870                  875              880

ctg cat ctc tgc gtc tcc cgc aag cac ttc gct ctg gaa cgg ggc tgc    2745
Leu His Leu Cys Val Ser Arg Lys His Phe Ala Leu Glu Arg Gly Cys
    885                  890              895

agg ctg cgt ggg ctg tca ccg ggg aac tac agc gtg cga atc cgg gcc    2793
Arg Leu Arg Gly Leu Ser Pro Gly Asn Tyr Ser Val Arg Ile Arg Ala
900                  905              910                  915

acc tcc ctt gcg ggc aac ggc tct tgg acg gaa ccc acc tat ttc tac    2841
Thr Ser Leu Ala Gly Asn Gly Ser Trp Thr Glu Pro Thr Tyr Phe Tyr
                920              925              930

gtg aca gac tat tta gac gtc ccg tca aat att gca aaa att atc atc    2889
Val Thr Asp Tyr Leu Asp Val Pro Ser Asn Ile Ala Lys Ile Ile Ile
            935              940              945

ggc ccc ctc atc ttt gtc ttt ctc ttc agt gtt gtg att gga agt att    2937
Gly Pro Leu Ile Phe Val Phe Leu Phe Ser Val Val Ile Gly Ser Ile
        950              955              960

tat cta ttc ctg aga aag agg cag cca gat ggg ccg ctg gga ccg ctt    2985
Tyr Leu Phe Leu Arg Lys Arg Gln Pro Asp Gly Pro Leu Gly Pro Leu
965              970              975

tac gct tct tca aac cct gag tat ctc agt gcc agt gat gtg ttt cca    3033
Tyr Ala Ser Ser Asn Pro Glu Tyr Leu Ser Ala Ser Asp Val Phe Pro
980              985              990                  995

tgc tct gtg tac gtg  ccg gac gag tgg gag  gtg tct cga gag aag      3078
Cys Ser Val Tyr Val  Pro Asp Glu Trp Glu  Val Ser Arg Glu Lys
            1000             1005                  1010

atc acc ctc ctt cga  gag ctg ggg cag ggc  tcc ttc ggc atg gtg      3123
Ile Thr Leu Leu Arg  Glu Leu Gly Gln Gly  Ser Phe Gly Met Val
            1015             1020                  1025

tat gag ggc aat gcc  agg gac atc atc aag  ggt gag gca gag acc      3168
Tyr Glu Gly Asn Ala  Arg Asp Ile Ile Lys  Gly Glu Ala Glu Thr
            1030             1035                  1040

cgc gtg gcg gtg aag  acg gtc aac gag tca  gcc agt ctc cga gag      3213
                                Page 25
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49321-111.ST25.txt
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                                 49321-111.ST25.txt
Arg Val Ala Val Lys   Thr Val Asn Glu Ser   Ala Ser Leu Arg Glu
            1045                      1050                    1055

cgg att gag ttc ctc   aat gag gcc tcg gtc   atg aag ggc ttc acc        3258
Arg Ile Glu Phe Leu   Asn Glu Ala Ser Val   Met Lys Gly Phe Thr
            1060                      1065                    1070

tgc cat cac gtg gtg   cgc ctc ctg gga gtg   gtg tcc aag ggc cag        3303
Cys His His Val Val   Arg Leu Leu Gly Val   Val Ser Lys Gly Gln
            1075                      1080                    1085

ccc acg ctg gtg gtg   atg gag ctg atg gct   cac gga gac ctg aag        3348
Pro Thr Leu Val Val   Met Glu Leu Met Ala   His Gly Asp Leu Lys
            1090                      1095                    1100

agc tac ctc cgt tct   ctg cgg cca gag gct   gag aat aat cct ggc        3393
Ser Tyr Leu Arg Ser   Leu Arg Pro Glu Ala   Glu Asn Asn Pro Gly
            1105                      1110                    1115

cgc cct ccc cct acc   ctt caa gag atg att   cag atg gcg gca gag        3438
Arg Pro Pro Pro Thr   Leu Gln Glu Met Ile   Gln Met Ala Ala Glu
            1120                      1125                    1130

att gct gac ggg atg   gcc tac ctg aac gcc   aag aag ttt gtg cat        3483
Ile Ala Asp Gly Met   Ala Tyr Leu Asn Ala   Lys Lys Phe Val His
            1135                      1140                    1145

cgg gac ctg gca gcg   aga aac tgc atg gtc   gcc cat gat ttt act        3528
Arg Asp Leu Ala Ala   Arg Asn Cys Met Val   Ala His Asp Phe Thr
            1150                      1155                    1160

gtc aaa att gga gac   ttt gga atg acc aga   gac atc tat gaa acg        3573
Val Lys Ile Gly Asp   Phe Gly Met Thr Arg   Asp Ile Tyr Glu Thr
            1165                      1170                    1175

gat tac tac cgg aaa   ggg ggc aag ggt ctg   ctc cct gta cgg tgg        3618
Asp Tyr Tyr Arg Lys   Gly Gly Lys Gly Leu   Leu Pro Val Arg Trp
            1180                      1185                    1190

atg gca ccg gag tcc   ctg aag gat ggg gtc   ttc acc act tct tct        3663
Met Ala Pro Glu Ser   Leu Lys Asp Gly Val   Phe Thr Thr Ser Ser
            1195                      1200                    1205

gac atg tgg tcc ttt   ggc gtg gtc ctt tgg   gaa atc acc agc ttg        3708
Asp Met Trp Ser Phe   Gly Val Val Leu Trp   Glu Ile Thr Ser Leu
            1210                      1215                    1220

gca gaa cag cct tac   caa ggc ctg tct aat   gaa cag gtg ttg aaa        3753
Ala Glu Gln Pro Tyr   Gln Gly Leu Ser Asn   Glu Gln Val Leu Lys
            1225                      1230                    1235

ttt gtc atg gat gga   ggg tat ctg gat caa   ccc gac aac tgt cca        3798
Phe Val Met Asp Gly   Gly Tyr Leu Asp Gln   Pro Asp Asn Cys Pro
            1240                      1245                    1250

gag aga gtc act gac   ctc atg cgc atg tgc   tgg caa ttc aac ccc        3843
Glu Arg Val Thr Asp   Leu Met Arg Met Cys   Trp Gln Phe Asn Pro
            1255                      1260                    1265

aac atg agg cca acc   ttc ctg gag att gtc   aac ctg ctc aag gac        3888
Asn Met Arg Pro Thr   Phe Leu Glu Ile Val   Asn Leu Leu Lys Asp
            1270                      1275                    1280
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49321-111.ST25.txt

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gac ctg cac ccc agc   ttt cca gag gtg tcg   ttc ttc cac agc gag        3933
Asp Leu His Pro Ser   Phe Pro Glu Val Ser   Phe Phe His Ser Glu
            1285                     1290                     1295


gag aac aag gct ccc   gag agt gag gag ctg   gag atg gag ttt gag        3978
Glu Asn Lys Ala Pro   Glu Ser Glu Glu Leu   Glu Met Glu Phe Glu
            1300                     1305                     1310


gac atg gag aat gtg   ccc ctg gac cgt tcc   tcg cac tgt cag agg        4023
Asp Met Glu Asn Val   Pro Leu Asp Arg Ser   Ser His Cys Gln Arg
            1315                     1320                     1325


gag gag gcg ggg ggc   cgg gat gga ggg tcc   tcg ctg ggt ttc aag        4068
Glu Glu Ala Gly Gly   Arg Asp Gly Gly Ser   Ser Leu Gly Phe Lys
            1330                     1335                     1340


cgg agc tac gag gaa   cac atc cct tac aca   cac atg aac gga ggc        4113
Arg Ser Tyr Glu Glu   His Ile Pro Tyr Thr   His Met Asn Gly Gly
            1345                     1350                     1355


aag aaa aac ggg cgg   att ctg acc ttg cct   cgg tcc aat cct tcc        4158
Lys Lys Asn Gly Arg   Ile Leu Thr Leu Pro   Arg Ser Asn Pro Ser
            1360                     1365                     1370


taa cagtgcctac cgtggcgggg gcgggcaggg gttcccattt tcgctttcct              4211

ctggtttgaa agcctctgga aaactcagga ttctcacgac tctaccatgt ccaatggagt       4271

tcagagatcg ttcctataca tttctgttca tcttaaggtg gactcgtttg gttaccaatt       4331

taactagtcc tgcagaggat ttaactgtga acctggaggg caaggggttt ccacagttgc       4391

tgctcctttg gggcaacgac ggtttcaaac caggattttg tgttttttcg ttcccccac        4451

ccgcccccag cagatggaaa gaaagcacct gtttttacaa attctttttt tttttttttt      4511

ttttgctgg tgtctgagct tcagtataaa agacaaaact tcctgtttgt ggaacaaaag        4571

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caggttgagc ttcaagatgg ttttttttggt tttttttttt tctctcatcc aggctgaagg     4691

atttttttt tctttacaaa atgagttcct caaattgacc aatagctgct gctttcatat        4751

tttggataag ggtctgtggt cccggcgtgt gctcacgtgt gtatgcacgt gtgtgtgtcc       4811

attagacacg gctgacgtgt gtgcaaagta tccatgcgga gttgatgctt tgggaattgg       4871

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ccctcccttc acattggtgg ccaagggagg agcatttcat ttggagtgat tatgaatctt       5051

ttcaagacca aaccaagcta ggacattaaa aaaaaaaaa agaaaagaa agaaaaaaca         5111

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ccatattta                                                               5180
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49321-111.ST25.txt

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<212>  PRT
<213>  Homo sapiens

<400>  12

Met Gly Thr Gly Gly Arg Arg Gly Ala Ala Ala Ala Pro Leu Leu Val
1               5                   10                  15


Ala Val Ala Ala Leu Leu Leu Gly Ala Ala Gly His Leu Tyr Pro Gly
                20                  25                  30


Glu Val Cys Pro Gly Met Asp Ile Arg Asn Asn Leu Thr Arg Leu His
        35                  40                  45


Glu Leu Glu Asn Cys Ser Val Ile Glu Gly His Leu Gln Ile Leu Leu
    50                  55                  60


Met Phe Lys Thr Arg Pro Glu Asp Phe Arg Asp Leu Ser Phe Pro Lys
65                  70                  75                  80


Leu Ile Met Ile Thr Asp Tyr Leu Leu Leu Phe Arg Val Tyr Gly Leu
                85                  90                  95


Glu Ser Leu Lys Asp Leu Phe Pro Asn Leu Thr Val Ile Arg Gly Ser
            100                 105                 110


Arg Leu Phe Phe Asn Tyr Ala Leu Val Ile Phe Glu Met Val His Leu
        115                 120                 125


Lys Glu Leu Gly Leu Tyr Asn Leu Met Asn Ile Thr Arg Gly Ser Val
    130                 135                 140


Arg Ile Glu Lys Asn Asn Glu Leu Cys Tyr Leu Ala Thr Ile Asp Trp
145                 150                 155                 160


Ser Arg Ile Leu Asp Ser Val Glu Asp Asn Tyr Ile Val Leu Asn Lys
                165                 170                 175


Asp Asp Asn Glu Glu Cys Gly Asp Ile Cys Pro Gly Thr Ala Lys Gly
            180                 185                 190


Lys Thr Asn Cys Pro Ala Thr Val Ile Asn Gly Gln Phe Val Glu Arg
    195                 200                 205


Cys Trp Thr His Ser His Cys Gln Lys Val Cys Pro Thr Ile Cys Lys
    210                 215                 220


Ser His Gly Cys Thr Ala Glu Gly Leu Cys Cys His Ser Glu Cys Leu
225                 230                 235                 240
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Gly Asn Cys Ser Gln Pro Asp Asp Pro Thr Lys Cys Val Ala Cys Arg
            245   250   255

Asn Phe Tyr Leu Asp Gly Arg Cys Val Glu Thr Cys Pro Pro Pro Tyr
            260   265   270

Tyr His Phe Gln Asp Trp Arg Cys Val Asn Phe Ser Phe Cys Gln Asp
            275   280   285

Leu His His Lys Cys Lys Asn Ser Arg Arg Gln Gly Cys His Gln Tyr
    290   295   300

Val Ile His Asn Asn Lys Cys Ile Pro Glu Cys Pro Ser Gly Tyr Thr
305   310   315   320

Met Asn Ser Ser Asn Leu Leu Cys Thr Pro Cys Leu Gly Pro Cys Pro
            325   330   335

Lys Val Cys His Leu Leu Glu Gly Glu Lys Thr Ile Asp Ser Val Thr
            340   345   350

Ser Ala Gln Glu Leu Arg Gly Cys Thr Val Ile Asn Gly Ser Leu Ile
            355   360   365

Ile Asn Ile Arg Gly Gly Asn Asn Leu Ala Ala Glu Leu Glu Ala Asn
    370   375   380

Leu Gly Leu Ile Glu Glu Ile Ser Gly Tyr Leu Lys Ile Arg Arg Ser
385   390   395   400

Tyr Ala Leu Val Ser Leu Ser Phe Phe Arg Lys Leu Arg Leu Ile Arg
            405   410   415

Gly Glu Thr Leu Glu Ile Gly Asn Tyr Ser Phe Tyr Ala Leu Asp Asn
            420   425   430

Gln Asn Leu Arg Gln Leu Trp Asp Trp Ser Lys His Asn Leu Thr Ile
    435   440   445

Thr Gln Gly Lys Leu Phe Phe His Tyr Asn Pro Lys Leu Cys Leu Ser
    450   455   460

Glu Ile His Lys Met Glu Glu Val Ser Gly Thr Lys Gly Arg Gln Glu
465   470   475   480

Arg Asn Asp Ile Ala Leu Lys Thr Asn Gly Asp Gln Ala Ser Cys Glu
                            Page 29

```
                                485                         490                          495

    Asn Glu Leu Leu Lys Phe Ser Tyr Ile Arg Thr Ser Phe Asp Lys Ile
                    500                 505                 510

    Leu Leu Arg Trp Glu Pro Tyr Trp Pro Asp Phe Arg Asp Leu Leu
            515                 520                 525

    Gly Phe Met Leu Phe Tyr Lys Glu Ala Pro Tyr Gln Asn Val Thr Glu
        530                 535                 540

    Phe Asp Gly Gln Asp Ala Cys Gly Ser Asn Ser Trp Thr Val Val Asp
    545                 550                 555                 560

    Ile Asp Pro Pro Leu Arg Ser Asn Asp Pro Lys Ser Gln Asn His Pro
                    565                 570                 575

    Gly Trp Leu Met Arg Gly Leu Lys Pro Trp Thr Gln Tyr Ala Ile Phe
                580                 585                 590

    Val Lys Thr Leu Val Thr Phe Ser Asp Glu Arg Arg Thr Tyr Gly Ala
                595                 600                 605

    Lys Ser Asp Ile Ile Tyr Val Gln Thr Asp Ala Thr Asn Pro Ser Val
        610                 615                 620

    Pro Leu Asp Pro Ile Ser Val Ser Asn Ser Ser Ser Gln Ile Ile Leu
    625                 630                 635                 640

    Lys Trp Lys Pro Pro Ser Asp Pro Asn Gly Asn Ile Thr His Tyr Leu
                    645                 650                 655

    Val Phe Trp Glu Arg Gln Ala Glu Asp Ser Glu Leu Phe Glu Leu Asp
                660                 665                 670

    Tyr Cys Leu Lys Gly Leu Lys Leu Pro Ser Arg Thr Trp Ser Pro Pro
            675                 680                 685

    Phe Glu Ser Glu Asp Ser Gln Lys His Asn Gln Ser Glu Tyr Glu Asp
        690                 695                 700

    Ser Ala Gly Glu Cys Cys Ser Cys Pro Lys Thr Asp Ser Gln Ile Leu
    705                 710                 715                 720

    Lys Glu Leu Glu Glu Ser Ser Phe Arg Lys Thr Phe Glu Asp Tyr Leu
                    725                 730                 735
```

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His Asn Val Val Phe Val Pro Arg Pro Ser Arg Lys Arg Arg Ser Leu
            740   745   750

Gly Asp Val Gly Asn Val Thr Val Ala Val Pro Thr Val Ala Ala Phe
        755   760   765

Pro Asn Thr Ser Ser Thr Ser Val Pro Thr Ser Pro Glu Glu His Arg
    770   775   780

Pro Phe Glu Lys Val Val Asn Lys Glu Ser Leu Val Ile Ser Gly Leu
785   790   795   800

Arg His Phe Thr Gly Tyr Arg Ile Glu Leu Gln Ala Cys Asn Gln Asp
                805   810   815

Thr Pro Glu Glu Arg Cys Ser Val Ala Ala Tyr Val Ser Ala Arg Thr
        820   825   830

Met Pro Glu Ala Lys Ala Asp Asp Ile Val Gly Pro Val Thr His Glu
        835   840   845

Ile Phe Glu Asn Asn Val Val His Leu Met Trp Gln Glu Pro Lys Glu
    850   855   860

Pro Asn Gly Leu Ile Val Leu Tyr Glu Val Ser Tyr Arg Arg Tyr Gly
865   870   875   880

Asp Glu Glu Leu His Leu Cys Val Ser Arg Lys His Phe Ala Leu Glu
                885   890   895

Arg Gly Cys Arg Leu Arg Gly Leu Ser Pro Gly Asn Tyr Ser Val Arg
            900   905   910

Ile Arg Ala Thr Ser Leu Ala Gly Asn Gly Ser Trp Thr Glu Pro Thr
    915   920   925

Tyr Phe Tyr Val Thr Asp Tyr Leu Asp Val Pro Ser Asn Ile Ala Lys
    930   935   940

Ile Ile Ile Gly Pro Leu Ile Phe Val Phe Leu Phe Ser Val Val Ile
945   950   955   960

Gly Ser Ile Tyr Leu Phe Leu Arg Lys Arg Gln Pro Asp Gly Pro Leu
            965   970   975

Gly Pro Leu Tyr Ala Ser Ser Asn Pro Glu Tyr Leu Ser Ala Ser Asp
        980   985   990

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Val Phe Pro Cys Ser Val Tyr Val Pro Asp Glu Trp Glu Val Ser Arg
        995   1000   1005

Glu Lys Ile Thr Leu Leu Arg Glu Leu Gly Gln Gly Ser Phe Gly
    1010   1015   1020

Met Val Tyr Glu Gly Asn Ala Arg Asp Ile Ile Lys Gly Glu Ala
    1025   1030   1035

Glu Thr Arg Val Ala Val Lys Thr Val Asn Glu Ser Ala Ser Leu
    1040   1045   1050

Arg Glu Arg Ile Glu Phe Leu Asn Glu Ala Ser Val Met Lys Gly
    1055   1060   1065

Phe Thr Cys His His Val Val Arg Leu Leu Gly Val Val Ser Lys
    1070   1075   1080

Gly Gln Pro Thr Leu Val Val Met Glu Leu Met Ala His Gly Asp
    1085   1090   1095

Leu Lys Ser Tyr Leu Arg Ser Leu Arg Pro Glu Ala Glu Asn Asn
    1100   1105   1110

Pro Gly Arg Pro Pro Pro Thr Leu Gln Glu Met Ile Gln Met Ala
    1115   1120   1125

Ala Glu Ile Ala Asp Gly Met Ala Tyr Leu Asn Ala Lys Lys Phe
    1130   1135   1140

Val His Arg Asp Leu Ala Ala Arg Asn Cys Met Val Ala His Asp
    1145   1150   1155

Phe Thr Val Lys Ile Gly Asp Phe Gly Met Thr Arg Asp Ile Tyr
    1160   1165   1170

Glu Thr Asp Tyr Tyr Arg Lys Gly Gly Lys Gly Leu Leu Pro Val
    1175   1180   1185

Arg Trp Met Ala Pro Glu Ser Leu Lys Asp Gly Val Phe Thr Thr
    1190   1195   1200

Ser Ser Asp Met Trp Ser Phe Gly Val Val Leu Trp Glu Ile Thr
    1205   1210   1215

Ser Leu Ala Glu Gln Pro Tyr Gln Gly Leu Ser Asn Glu Gln Val
    1220   1225   1230

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```
Leu Lys  Phe Val Met Asp Gly  Gly Tyr Leu Asp Gln  Pro Asp Asn
    1235                1240             1245
```

```
Cys Pro  Glu Arg Val Thr Asp  Leu Met Arg Met Cys  Trp Gln Phe
    1250                1255             1260
```

```
Asn Pro  Asn Met Arg Pro Thr  Phe Leu Glu Ile Val  Asn Leu Leu
    1265                1270             1275
```

```
Lys Asp  Asp Leu His Pro Ser  Phe Pro Glu Val Ser  Phe Phe His
    1280                1285             1290
```

```
Ser Glu  Glu Asn Lys Ala Pro  Glu Ser Glu Glu Leu  Glu Met Glu
    1295                1300             1305
```

```
Phe Glu  Asp Met Glu Asn Val  Pro Leu Asp Arg Ser  Ser His Cys
    1310                1315             1320
```

```
Gln Arg  Glu Glu Ala Gly Gly  Arg Asp Gly Gly Ser  Ser Leu Gly
    1325                1330             1335
```

```
Phe Lys  Arg Ser Tyr Glu Glu  His Ile Pro Tyr Thr  His Met Asn
    1340                1345             1350
```

```
Gly Gly  Lys Lys Asn Gly Arg  Ile Leu Thr Leu Pro  Arg Ser Asn
    1355                1360             1365
```

```
Pro Ser
    1370
```

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<212>  DNA
<213>  Homo sapiens
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<222>  (22)..(2952)
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<222>  (3101)..(3101)
<223>  C and T alleles exist at this position
```

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<220>
<221>  variation
<222>  (4354)..(4354)
<223>  A and G alleles exist at this position
```

```
<220>
```

49321-111.ST25.txt

<221>   variation
<222>   (4656)..(4656)
<223>   G and T alleles exist at this position

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                        Met Arg Gly Ala Arg Gly Ala Trp Asp Phe
                        1   5   10

ctc tgc gtt ctg ctc cta ctg ctt cgc gtc cag aca ggc tct tct caa   99
Leu Cys Val Leu Leu Leu Leu Leu Arg Val Gln Thr Gly Ser Ser Gln
                15   20   25

cca tct gtg agt cca ggg gaa ccg tct cca cca tcc atc cat cca gga   147
Pro Ser Val Ser Pro Gly Glu Pro Ser Pro Pro Ser Ile His Pro Gly
            30   35   40

aaa tca gac tta ata gtc cgc gtg ggc gac gag att agg ctg tta tgc   195
Lys Ser Asp Leu Ile Val Arg Val Gly Asp Glu Ile Arg Leu Leu Cys
            45   50   55

act gat ccg ggc ttt gtc aaa tgg act ttt gag atc ctg gat gaa acg   243
Thr Asp Pro Gly Phe Val Lys Trp Thr Phe Glu Ile Leu Asp Glu Thr
        60   65   70

aat gag aat aag cag aat gaa tgg atc acg gaa aag gca gaa gcc acc   291
Asn Glu Asn Lys Gln Asn Glu Trp Ile Thr Glu Lys Ala Glu Ala Thr
75   80   85   90

aac acc ggc aaa tac acg tgc acc aac aaa cac ggc tta agc aat tcc   339
Asn Thr Gly Lys Tyr Thr Cys Thr Asn Lys His Gly Leu Ser Asn Ser
                95   100   105

att tat gtg ttt gtt aga gat cct gcc aag ctt ttc ctt gtt gac cgc   387
Ile Tyr Val Phe Val Arg Asp Pro Ala Lys Leu Phe Leu Val Asp Arg
                110   115   120

tcc ttg tat ggg aaa gaa gac aac gac acg ctg gtc cgc tgt cct ctc   435
Ser Leu Tyr Gly Lys Glu Asp Asn Asp Thr Leu Val Arg Cys Pro Leu
            125   130   135

aca gac cca gaa gtg acc aat tat tcc ctc aag ggg tgc cag ggg aag   483
Thr Asp Pro Glu Val Thr Asn Tyr Ser Leu Lys Gly Cys Gln Gly Lys
        140   145   150

cct ctt ccc aag gac ttg agg ttt att cct gac ccc aag gcg ggc atc   531
Pro Leu Pro Lys Asp Leu Arg Phe Ile Pro Asp Pro Lys Ala Gly Ile
155   160   165   170

atg atc aaa agt gtg aaa cgc gcc tac cat cgg ctc tgt ctg cat tgt   579
Met Ile Lys Ser Val Lys Arg Ala Tyr His Arg Leu Cys Leu His Cys
                175   180   185

tct gtg gac cag gag ggc aag tca gtg ctg tcg gaa aaa ttc atc ctg   627
Ser Val Asp Gln Glu Gly Lys Ser Val Leu Ser Glu Lys Phe Ile Leu
            190   195   200

aaa gtg agg cca gcc ttc aaa gct gtg cct gtt gtg tct gtg tcc aaa   675
Lys Val Arg Pro Ala Phe Lys Ala Val Pro Val Val Ser Val Ser Lys
        205   210   215

gca agc tat ctt ctt agg gaa ggg gaa gaa ttc aca gtg acg tgc aca   723
Ala Ser Tyr Leu Leu Arg Glu Gly Glu Glu Phe Thr Val Thr Cys Thr

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```
                                 49321-111.ST25.txt
      220                225                230

ata aaa gat gtg tct agt tct gtg tac tca acg tgg aaa aga gaa aac    771
Ile Lys Asp Val Ser Ser Ser Val Tyr Ser Thr Trp Lys Arg Glu Asn
235                 240                 245                 250

agt cag act aaa cta cag gag aaa tat aat agc tgg cat cac ggt gac    819
Ser Gln Thr Lys Leu Gln Glu Lys Tyr Asn Ser Trp His His Gly Asp
                255                 260                 265

ttc aat tat gaa cgt cag gca acg ttg act atc agt tca gcg aga gtt    867
Phe Asn Tyr Glu Arg Gln Ala Thr Leu Thr Ile Ser Ser Ala Arg Val
                270                 275                 280

aat gat tct gga gtg ttc atg tgt tat gcc aat aat act ttt gga tca    915
Asn Asp Ser Gly Val Phe Met Cys Tyr Ala Asn Asn Thr Phe Gly Ser
                285                 290                 295

gca aat gtc aca aca acc ttg gaa gta gta gat aaa gga ttc att aat    963
Ala Asn Val Thr Thr Thr Leu Glu Val Val Asp Lys Gly Phe Ile Asn
                300                 305                 310

atc ttc ccc atg ata aac act aca gta ttt gta aac gat gga gaa aat   1011
Ile Phe Pro Met Ile Asn Thr Thr Val Phe Val Asn Asp Gly Glu Asn
315                 320                 325                 330

gta gat ttg att gtt gaa tat gaa gca ttc ccc aaa cct gaa cac cag   1059
Val Asp Leu Ile Val Glu Tyr Glu Ala Phe Pro Lys Pro Glu His Gln
                335                 340                 345

cag tgg atc tat atg aac aga acc ttc act gat aaa tgg gaa gat tat   1107
Gln Trp Ile Tyr Met Asn Arg Thr Phe Thr Asp Lys Trp Glu Asp Tyr
                350                 355                 360

ccc aag tct gag aat gaa agt aat atc aga tac gta agt gaa ctt cat   1155
Pro Lys Ser Glu Asn Glu Ser Asn Ile Arg Tyr Val Ser Glu Leu His
                365                 370                 375

cta acg aga tta aaa ggc acc gaa gga ggc act tac aca ttc cta gtg   1203
Leu Thr Arg Leu Lys Gly Thr Glu Gly Gly Thr Tyr Thr Phe Leu Val
380                 385                 390

tcc aat tct gac gtc aat gct gcc ata gca ttt aat gtt tat gtg aat   1251
Ser Asn Ser Asp Val Asn Ala Ala Ile Ala Phe Asn Val Tyr Val Asn
395                 400                 405                 410

aca aaa cca gaa atc ctg act tac gac agg ctc gtg aat ggc atg ctc   1299
Thr Lys Pro Glu Ile Leu Thr Tyr Asp Arg Leu Val Asn Gly Met Leu
                415                 420                 425

caa tgt gtg gca gca gga ttc cca gag ccc aca ata gat tgg tat ttt   1347
Gln Cys Val Ala Ala Gly Phe Pro Glu Pro Thr Ile Asp Trp Tyr Phe
                430                 435                 440

tgt cca gga act gag cag aga tgc tct gct tct gta ctg cca gtg gat   1395
Cys Pro Gly Thr Glu Gln Arg Cys Ser Ala Ser Val Leu Pro Val Asp
                445                 450                 455

gtg cag aca cta aac tca tct ggg cca ccg ttt gga aag cta gtg gtt   1443
Val Gln Thr Leu Asn Ser Ser Gly Pro Pro Phe Gly Lys Leu Val Val
460                 465                 470

cag agt tct ata gat tct agt gca ttc aag cac aat ggc acg gtt gaa   1491
```

```
                                        49321-111.ST25.txt
Gln Ser Ser Ile Asp Ser Ser Ala Phe Lys His Asn Gly Thr Val Glu
475             480             485                 490

tgt aag gct tac aac gat gtg ggc aag act tct gcc tat ttt aac ttt    1539
Cys Lys Ala Tyr Asn Asp Val Gly Lys Thr Ser Ala Tyr Phe Asn Phe
                495             500                 505

gca ttt aaa ggt aac aac aaa gag caa atc cat ccc cac acc ctg ttc    1587
Ala Phe Lys Gly Asn Asn Lys Glu Gln Ile His Pro His Thr Leu Phe
            510             515                 520

act cct ttg ctg att ggt ttc gta atc gta gct ggc atg atg tgc att    1635
Thr Pro Leu Leu Ile Gly Phe Val Ile Val Ala Gly Met Met Cys Ile
            525             530                 535

att gtg atg att ctg acc tac aaa tat tta cag aaa ccc atg tat gaa    1683
Ile Val Met Ile Leu Thr Tyr Lys Tyr Leu Gln Lys Pro Met Tyr Glu
        540             545                 550

gta cag tgg aag gtt gtt gag gag ata aat gga aac aat tat gtt tac    1731
Val Gln Trp Lys Val Val Glu Glu Ile Asn Gly Asn Asn Tyr Val Tyr
555             560                 565                 570

ata gac cca aca caa ctt cct tat gat cac aaa tgg gag ttt ccc aga    1779
Ile Asp Pro Thr Gln Leu Pro Tyr Asp His Lys Trp Glu Phe Pro Arg
                575             580                 585

aac agg ctg agt ttt ggg aaa acc ctg ggt gct gga gct ttc ggg aag    1827
Asn Arg Leu Ser Phe Gly Lys Thr Leu Gly Ala Gly Ala Phe Gly Lys
            590             595                 600

gtt gtt gag gca act gct tat ggc tta att aag tca gat gcg gcc atg    1875
Val Val Glu Ala Thr Ala Tyr Gly Leu Ile Lys Ser Asp Ala Ala Met
            605             610                 615

act gtc gct gta aag atg ctc aag ccg agt gcc cat ttg aca gaa cgg    1923
Thr Val Ala Val Lys Met Leu Lys Pro Ser Ala His Leu Thr Glu Arg
        620             625                 630

gaa gcc ctc atg tct gaa ctc aaa gtc ctg agt tac ctt ggt aat cac    1971
Glu Ala Leu Met Ser Glu Leu Lys Val Leu Ser Tyr Leu Gly Asn His
635             640                 645                 650

atg aat att gtg aat cta ctt gga gcc tgc acc att gga ggg ccc acc    2019
Met Asn Ile Val Asn Leu Leu Gly Ala Cys Thr Ile Gly Gly Pro Thr
            655             660                 665

ctg gtc att aca gaa tat tgt tgc tat ggt gat ctt ttg aat ttt ttg    2067
Leu Val Ile Thr Glu Tyr Cys Cys Tyr Gly Asp Leu Leu Asn Phe Leu
            670             675                 680

aga aga aaa cgt gat tca ttt att tgt tca aag cag gaa gat cat gca    2115
Arg Arg Lys Arg Asp Ser Phe Ile Cys Ser Lys Gln Glu Asp His Ala
            685             690                 695

gaa gct gca ctt tat aag aat ctt ctg cat tca aag gag tct tcc tgc    2163
Glu Ala Ala Leu Tyr Lys Asn Leu Leu His Ser Lys Glu Ser Ser Cys
700             705                 710

agc gat agt act aat gag tac atg gac atg aaa cct gga gtt tct tat    2211
Ser Asp Ser Thr Asn Glu Tyr Met Asp Met Lys Pro Gly Val Ser Tyr
715             720                 725                 730
```

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```
gtt gtc cca acc aag gcc gac aaa agg aga tct gtg aga ata ggc tca    2259
Val Val Pro Thr Lys Ala Asp Lys Arg Arg Ser Val Arg Ile Gly Ser
            735             740             745

tac ata gaa aga gat gtg act ccc gcc atc atg gag gat gac gag ttg    2307
Tyr Ile Glu Arg Asp Val Thr Pro Ala Ile Met Glu Asp Asp Glu Leu
            750             755             760

gcc cta gac tta gaa gac ttg ctg agc ttt tct tac cag gtg gca aag    2355
Ala Leu Asp Leu Glu Asp Leu Leu Ser Phe Ser Tyr Gln Val Ala Lys
            765             770             775

ggc atg gct ttc ctc gcc tcc aag aat tgt att cac aga gac ttg gca    2403
Gly Met Ala Phe Leu Ala Ser Lys Asn Cys Ile His Arg Asp Leu Ala
        780             785             790

gcc aga aat atc ctc ctt act cat ggt cgg atc aca aag att tgt gat    2451
Ala Arg Asn Ile Leu Leu Thr His Gly Arg Ile Thr Lys Ile Cys Asp
795             800             805             810

ttt ggt cta gcc aga gac atc aag aat gat tct aat tat gtg gtt aaa    2499
Phe Gly Leu Ala Arg Asp Ile Lys Asn Asp Ser Asn Tyr Val Val Lys
                815             820             825

gga aac gct cga cta cct gtg aag tgg atg gca cct gaa agc att ttc    2547
Gly Asn Ala Arg Leu Pro Val Lys Trp Met Ala Pro Glu Ser Ile Phe
            830             835             840

aac tgt gta tac acg ttt gaa agt gac gtc tgg tcc tat ggg att ttt    2595
Asn Cys Val Tyr Thr Phe Glu Ser Asp Val Trp Ser Tyr Gly Ile Phe
        845             850             855

ctt tgg gag ctg ttc tct tta gga agc agc ccc tat cct gga atg ccg    2643
Leu Trp Glu Leu Phe Ser Leu Gly Ser Ser Pro Tyr Pro Gly Met Pro
    860             865             870

gtc gat tct aag ttc tac aag atg atc aag gaa ggc ttc cgg atg ctc    2691
Val Asp Ser Lys Phe Tyr Lys Met Ile Lys Glu Gly Phe Arg Met Leu
875             880             885             890

agc cct gaa cac gca cct gct gaa atg tat gac ata atg aag act tgc    2739
Ser Pro Glu His Ala Pro Ala Glu Met Tyr Asp Ile Met Lys Thr Cys
                895             900             905

tgg gat gca gat ccc cta aaa aga cca aca ttc aag caa att gtt cag    2787
Trp Asp Ala Asp Pro Leu Lys Arg Pro Thr Phe Lys Gln Ile Val Gln
            910             915             920

cta att gag aag cag att tca gag agc acc aat cat att tac tcc aac    2835
Leu Ile Glu Lys Gln Ile Ser Glu Ser Thr Asn His Ile Tyr Ser Asn
            925             930             935

tta gca aac tgc agc ccc aac cga cag aag ccc gtg gta gac cat tct    2883
Leu Ala Asn Cys Ser Pro Asn Arg Gln Lys Pro Val Val Asp His Ser
        940             945             950

gtg cgg atc aat tct gtc ggc agc acc gct tcc tcc tcc cag cct ctg    2931
Val Arg Ile Asn Ser Val Gly Ser Thr Ala Ser Ser Ser Gln Pro Leu
955             960             965             970

ctt gtg cac gac gat gtc tga gcagaatcag tgtttgggtc acccctccag       2982
Leu Val His Asp Asp Val
            975
```

49321-111.ST25.txt

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gaatgatctc ttcttttggc ttccatgatg gttatttt.ct tttctttcaa cttgcatcca   3042

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gaccactgca tgagctttta tactaccgac ctggttttta aatagagttt gctattagag   3582

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ccgtgttcat acatttgagg ggaaaacacc ataaggtttc gtttctgtat acaaccctgg   3702

cattatgtcc actgtgtata gaagtagatt aagagccata taagtttgaa ggaaacagtt   3762

aataccattt tttaaggaaa caatataacc acaaagcaca gtttgaacaa aatctcctct   3822

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gtacgtttgt atgtgtgtag acaaatattt ggaggggtat ttttgccctg agtccaagag   4122

ggtcctttag tacctgaaaa gtaacttggc tttcattatt agtactgctc ttgtttcttt   4182

tcacatagct gtctagagta gcttaccaga agcttccata gtggtgcaga ggaagtggaa   4242

ggcatcagtc cctatgtatt tgcagttcac ctgcacttaa ggcactctgt tatttagact   4302

catcttactg tacctgttcc ttagaccttc cataatgcta ctgtctcact graacattta   4362

aattttaccc tttagactgt agcctggata ttattcttgt agtttacctc tttaaaaaca   4422

aaacaaaaca aaacaaaaaa ctcccccttcc tcactgccca atataaaagg caaatgtgta   4482

catggcagag tttgtgtgtt gtcttgaaag attcaggtat gttgccttta tggtttcccc   4542

cttctacatt tcttagacta catttagaga actgtggccg ttatctggaa gtaaccattt   4602

gcactggagt tctatgctct cgcacctttc caaagttaac agattttggg gttktgttgt   4662

cacccaagag attgttgttt gccatacttt gtctgaaaaa ttcctttgtg tttctattga   4722

cttcaatgat agtaagaaaa gtggttgtta gttatagatg tctaggtact tcaggggcac   4782

ttcattgaga gttttgtctt gccatacttt gtctgaaaaa ttcctttgtg tttctattga   4842
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                              49321-111.ST25.txt
cttcaatgat  agtaagaaaa  gtggttgtta  gttatagatg  tctaggtact  tcaggggcac    4902

ttcattgaga  gttttgtcaa  tgtcttttga  atattcccaa  gcccatgagt  ccttgaaaat    4962

attttttata  tatacagtaa  ctttatgtgt  aaatacataa  gcggcgtaag  tttaaaggat    5022

gttggtgttc  cacgtgtttt  attcctgtat  gttgtccaat  tgttgacagt  tctgaagaat    5082

tc                                                                        5084
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<211>  976
<212>  PRT
<213>  Homo sapiens

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Met Arg Gly Ala Arg Gly Ala Trp Asp Phe Leu Cys Val Leu Leu Leu
1               5                   10                  15


Leu Leu Arg Val Gln Thr Gly Ser Ser Gln Pro Ser Val Ser Pro Gly
            20                  25                  30


Glu Pro Ser Pro Pro Ser Ile His Pro Gly Lys Ser Asp Leu Ile Val
        35                  40                  45


Arg Val Gly Asp Glu Ile Arg Leu Leu Cys Thr Asp Pro Gly Phe Val
    50                  55                  60


Lys Trp Thr Phe Glu Ile Leu Asp Glu Thr Asn Glu Asn Lys Gln Asn
65                  70                  75                  80


Glu Trp Ile Thr Glu Lys Ala Glu Ala Thr Asn Thr Gly Lys Tyr Thr
                85                  90                  95


Cys Thr Asn Lys His Gly Leu Ser Asn Ser Ile Tyr Val Phe Val Arg
                100                 105                 110


Asp Pro Ala Lys Leu Phe Leu Val Asp Arg Ser Leu Tyr Gly Lys Glu
            115                 120                 125


Asp Asn Asp Thr Leu Val Arg Cys Pro Leu Thr Asp Pro Glu Val Thr
        130                 135                 140


Asn Tyr Ser Leu Lys Gly Cys Gln Gly Lys Pro Leu Pro Lys Asp Leu
145                 150                 155                 160


Arg Phe Ile Pro Asp Pro Lys Ala Gly Ile Met Ile Lys Ser Val Lys
                165                 170                 175


Arg Ala Tyr His Arg Leu Cys Leu His Cys Ser Val Asp Gln Glu Gly
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               180   185   190

    Lys Ser Val Leu Ser Glu Lys Phe Ile Leu Lys Val Arg Pro Ala Phe
            195   200   205

    Lys Ala Val Pro Val Val Ser Val Ser Lys Ala Ser Tyr Leu Leu Arg
    210   215   220

    Glu Gly Glu Glu Phe Thr Val Thr Cys Thr Ile Lys Asp Val Ser Ser
    225   230   235   240

    Ser Val Tyr Ser Thr Trp Lys Arg Glu Asn Ser Gln Thr Lys Leu Gln
                245   250   255

    Glu Lys Tyr Asn Ser Trp His His Gly Asp Phe Asn Tyr Glu Arg Gln
                260   265   270

    Ala Thr Leu Thr Ile Ser Ser Ala Arg Val Asn Asp Ser Gly Val Phe
            275   280   285

    Met Cys Tyr Ala Asn Asn Thr Phe Gly Ser Ala Asn Val Thr Thr Thr
        290   295   300

    Leu Glu Val Val Asp Lys Gly Phe Ile Asn Ile Phe Pro Met Ile Asn
    305   310   315   320

    Thr Thr Val Phe Val Asn Asp Gly Glu Asn Val Asp Leu Ile Val Glu
                325   330   335

    Tyr Glu Ala Phe Pro Lys Pro Glu His Gln Gln Trp Ile Tyr Met Asn
                340   345   350

    Arg Thr Phe Thr Asp Lys Trp Glu Asp Tyr Pro Lys Ser Glu Asn Glu
            355   360   365

    Ser Asn Ile Arg Tyr Val Ser Glu Leu His Leu Thr Arg Leu Lys Gly
        370   375   380

    Thr Glu Gly Gly Thr Tyr Thr Phe Leu Val Ser Asn Ser Asp Val Asn
    385   390   395   400

    Ala Ala Ile Ala Phe Asn Val Tyr Val Asn Thr Lys Pro Glu Ile Leu
            405   410   415

    Thr Tyr Asp Arg Leu Val Asn Gly Met Leu Gln Cys Val Ala Ala Gly
            420   425   430

49321-111.ST25.txt

Phe Pro Glu Pro Thr Ile Asp Trp Tyr Phe Cys Pro Gly Thr Glu Gln
        435   440   445

Arg Cys Ser Ala Ser Val Leu Pro Val Asp Val Gln Thr Leu Asn Ser
    450   455   460

Ser Gly Pro Pro Phe Gly Lys Leu Val Val Gln Ser Ser Ile Asp Ser
465   470   475   480

Ser Ala Phe Lys His Asn Gly Thr Val Glu Cys Lys Ala Tyr Asn Asp
            485   490   495

Val Gly Lys Thr Ser Ala Tyr Phe Asn Phe Ala Phe Lys Gly Asn Asn
        500   505   510

Lys Glu Gln Ile His Pro His Thr Leu Phe Thr Pro Leu Leu Ile Gly
        515   520   525

Phe Val Ile Val Ala Gly Met Met Cys Ile Ile Val Met Ile Leu Thr
    530   535   540

Tyr Lys Tyr Leu Gln Lys Pro Met Tyr Glu Val Gln Trp Lys Val Val
545   550   555   560

Glu Glu Ile Asn Gly Asn Asn Tyr Val Tyr Ile Asp Pro Thr Gln Leu
            565   570   575

Pro Tyr Asp His Lys Trp Glu Phe Pro Arg Asn Arg Leu Ser Phe Gly
        580   585   590

Lys Thr Leu Gly Ala Gly Ala Phe Gly Lys Val Val Glu Ala Thr Ala
    595   600   605

Tyr Gly Leu Ile Lys Ser Asp Ala Ala Met Thr Val Ala Val Lys Met
610   615   620

Leu Lys Pro Ser Ala His Leu Thr Glu Arg Glu Ala Leu Met Ser Glu
625   630   635   640

Leu Lys Val Leu Ser Tyr Leu Gly Asn His Met Asn Ile Val Asn Leu
            645   650   655

Leu Gly Ala Cys Thr Ile Gly Gly Pro Thr Leu Val Ile Thr Glu Tyr
            660   665   670

Cys Cys Tyr Gly Asp Leu Leu Asn Phe Leu Arg Arg Lys Arg Asp Ser
        675   680   685

49321-111.ST25.txt

```
Phe Ile Cys Ser Lys Gln Glu Asp His Ala Glu Ala Ala Leu Tyr Lys
    690             695             700

Asn Leu Leu His Ser Lys Glu Ser Ser Cys Ser Asp Ser Thr Asn Glu
705             710             715             720

Tyr Met Asp Met Lys Pro Gly Val Ser Tyr Val Val Pro Thr Lys Ala
            725             730             735

Asp Lys Arg Arg Ser Val Arg Ile Gly Ser Tyr Ile Glu Arg Asp Val
        740             745             750

Thr Pro Ala Ile Met Glu Asp Asp Glu Leu Ala Leu Asp Leu Glu Asp
    755             760             765

Leu Leu Ser Phe Ser Tyr Gln Val Ala Lys Gly Met Ala Phe Leu Ala
770             775             780

Ser Lys Asn Cys Ile His Arg Asp Leu Ala Ala Arg Asn Ile Leu Leu
785             790             795             800

Thr His Gly Arg Ile Thr Lys Ile Cys Asp Phe Gly Leu Ala Arg Asp
            805             810             815

Ile Lys Asn Asp Ser Asn Tyr Val Val Lys Gly Asn Ala Arg Leu Pro
        820             825             830

Val Lys Trp Met Ala Pro Glu Ser Ile Phe Asn Cys Val Tyr Thr Phe
        835             840             845

Glu Ser Asp Val Trp Ser Tyr Gly Ile Phe Leu Trp Glu Leu Phe Ser
    850             855             860

Leu Gly Ser Ser Pro Tyr Pro Gly Met Pro Val Asp Ser Lys Phe Tyr
865             870             875             880

Lys Met Ile Lys Glu Gly Phe Arg Met Leu Ser Pro Glu His Ala Pro
            885             890             895

Ala Glu Met Tyr Asp Ile Met Lys Thr Cys Trp Asp Ala Asp Pro Leu
            900             905             910

Lys Arg Pro Thr Phe Lys Gln Ile Val Gln Leu Ile Glu Lys Gln Ile
        915             920             925

Ser Glu Ser Thr Asn His Ile Tyr Ser Asn Leu Ala Asn Cys Ser Pro
930             935             940
```

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49321-111.ST25.txt

```
Asn Arg Gln Lys Pro Val Val Asp His Ser Val Arg Ile Asn Ser Val
945             950             955             960


Gly Ser Thr Ala Ser Ser Ser Gln Pro Leu Leu Val His Asp Asp Val
                965             970             975
```

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<210>  15
<211>  25
<212>  DNA
<213>  artificial sequence

<220>
<223>  RDC-1-specific PMO antisense oligonucleotide

<400>  15
gaagagatgc agatccatcg ttctg                                     25
```

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<210>  16
<211>  25
<212>  DNA
<213>  artificial sequence

<220>
<223>  IGFBP-2-specific PMO antisense oligonucleotide

<400>  16
ggcagcccac tctctcggca gcatg                                     25
```

```
<210>  17
<211>  25
<212>  DNA
<213>  artificial sequence

<220>
<223>  FLJ14103-specific PMO antisense oligonucleotide

<400>  17
ggctccatct tgggctctgg gctcc                                     25
```

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<210>  18
<211>  25
<212>  DNA
<213>  artificial sequence

<220>
<223>  KIAA0367-specific PMO antisense oligonucleotide

<400>  18
gtcagtttac tcatgtcatc tattg                                     25
```

```
<210>  19
<211>  25
<212>  DNA
<213>  artificial sequence
```

49321-111.ST25.txt

```
<220>
<223>  Neuritin-specific PMO antisense oligonucleotide

<400>  19
ttaactccca tcctacgttt agtca                                          25


<210>  20
<211>  22
<212>  DNA
<213>  artificial sequence

<220>
<223>  INSR-specific PMO antisense oligonucleotide

<400>  20
gggtctcctc ggatcaggcg cg                                             22


<210>  21
<211>  23
<212>  DNA
<213>  artificial sequence

<220>
<223>  KIT-specific PMO antisense oligonucleotide

<400>  21
cgcctctcat cgcggtagct gcg                                            23


<210>  22
<211>  22
<212>  DNA
<213>  artificial sequence

<220>
<223>  IFACTOR-specific PMO antisense oligonucleotide

<400>  22
agcttcatgt tggaggtgtt cg                                             22


<210>  23
<211>  25
<212>  DNA
<213>  artificial sequence

<220>
<223>  LMO2-specific PMO antisense oligonucleotide

<400>  23
gccgaggaca ttggggaggg aggcg                                          25


<210>  24
<211>  25
<212>  DNA
<213>  artificial sequence

<220>
<223>  MFAP3-specific PMO antisense oligonucleotide
```

49321-111.ST25.txt

```
<400>  24
tgaataagca acaatgtagc ttcat                                              25


<210>  25
<211>  1946
<212>  DNA
<213>  Homo sapiens


<220>
<221>  CDS
<222>  (274)..(1527)

<400>  25
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ggggaaaggg aagggtgcca cgtccgagca gccgccttga ctggggaagg gtctgaatcc      120

cacccttggc attgcttggt ggagactgag atacccgtgc tccgctcgcc tccttggttg      180

aagatttctc cttccctcac gtgatttgag ccccgttttt attttctgtg agccacgtcc      240

tcctcgagcg gggtcaatct ggcaaaagga gtg atg cgc ttc gcc tgg acc gtg      294
                                  Met Arg Phe Ala Trp Thr Val
                                    1               5

ctc ctg ctc ggg cct ttg cag ctc tgc gcg cta gtg cac tgc gcc cct      342
Leu Leu Leu Gly Pro Leu Gln Leu Cys Ala Leu Val His Cys Ala Pro
                10                  15                  20

ccc gcc gcc ggc caa cag cag ccc ccg cgc gag ccg ccg gcg gct ccg      390
Pro Ala Ala Gly Gln Gln Gln Pro Pro Arg Glu Pro Pro Ala Ala Pro
    25                  30                  35

ggc gcc tgg cgc cag cag atc caa tgg gag aac aac ggg cag gtg ttc      438
Gly Ala Trp Arg Gln Gln Ile Gln Trp Glu Asn Asn Gly Gln Val Phe
40                  45                  50                  55

agc ttg ctg agc ctg ggc tca cag tac cag cct cag cgc cgc cgg gac      486
Ser Leu Leu Ser Leu Gly Ser Gln Tyr Gln Pro Gln Arg Arg Arg Asp
                60                  65                  70

ccg ggc gcc gcc gtc cct ggt gca gcc aac gcc tcc gcc cag cag ccc      534
Pro Gly Ala Ala Val Pro Gly Ala Ala Asn Ala Ser Ala Gln Gln Pro
            75                  80                  85

cgc act ccg atc ctg ctg atc cgc gac aac cgc acc gcc gcg gcg cga      582
Arg Thr Pro Ile Leu Leu Ile Arg Asp Asn Arg Thr Ala Ala Ala Arg
            90                  95                  100

acg cgg acg gcc ggc tca tct gga gtc acc gct ggc cgc ccc agg ccc      630
Thr Arg Thr Ala Gly Ser Ser Gly Val Thr Ala Gly Arg Pro Arg Pro
    105                 110                 115

acc gcc cgt cac tgg ttc caa gct ggc tac tcg aca tct aga gcc cgc      678
Thr Ala Arg His Trp Phe Gln Ala Gly Tyr Ser Thr Ser Arg Ala Arg
120                 125                 130                 135

gaa gct ggc gcc tcg cgc gcg gag aac cag aca gcg ccg gga gaa gtt      726
Glu Ala Gly Ala Ser Arg Ala Glu Asn Gln Thr Ala Pro Gly Glu Val
                140                 145                 150
```

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```
                              49321-111.ST25.txt
cct gcg ctc agt aac ctg cgg ccg ccc agc cgc gtg gac ggc atg gtg     774
Pro Ala Leu Ser Asn Leu Arg Pro Pro Ser Arg Val Asp Gly Met Val
            155                 160                 165

ggc gac gac cct tac aac ccc tac aag tac tct gac gac aac cct tat     822
Gly Asp Asp Pro Tyr Asn Pro Tyr Lys Tyr Ser Asp Asp Asn Pro Tyr
            170                 175                 180

tac aac tac tac gat act tat gaa agg ccc aga cct ggg ggc agg tac     870
Tyr Asn Tyr Tyr Asp Thr Tyr Glu Arg Pro Arg Pro Gly Gly Arg Tyr
            185                 190                 195

cgg ccc gga tac ggc act ggc tac ttc cag tac ggt ctc cca gac ctg     918
Arg Pro Gly Tyr Gly Thr Gly Tyr Phe Gln Tyr Gly Leu Pro Asp Leu
200                 205                 210                 215

gtg gcc gac ccc tac tac atc cag gcg tcc acg tac gtg cag aag atg     966
Val Ala Asp Pro Tyr Tyr Ile Gln Ala Ser Thr Tyr Val Gln Lys Met
                220                 225                 230

tcc atg tac aac ctg aga tgc gcg gcg gag gaa aac tgt ctg gcc agt    1014
Ser Met Tyr Asn Leu Arg Cys Ala Ala Glu Glu Asn Cys Leu Ala Ser
            235                 240                 245

aca gca tac agg gca gat gtc aga gat tat gat cac agg gtg ctg ctc    1062
Thr Ala Tyr Arg Ala Asp Val Arg Asp Tyr Asp His Arg Val Leu Leu
            250                 255                 260

aga ttt ccc caa aga gtg aaa aac caa ggg aca tca gat ttc tta ccc    1110
Arg Phe Pro Gln Arg Val Lys Asn Gln Gly Thr Ser Asp Phe Leu Pro
265                 270                 275

agc cga cca aga tat tcc tgg gaa tgg cac agt tgt cat caa cat tac    1158
Ser Arg Pro Arg Tyr Ser Trp Glu Trp His Ser Cys His Gln His Tyr
280                 285                 290                 295

cac agt atg gat gag ttt agc cac tat gac ctg ctt gat gcc aac acc    1206
His Ser Met Asp Glu Phe Ser His Tyr Asp Leu Leu Asp Ala Asn Thr
                300                 305                 310

cag agg aga gtg gct gaa ggc cac aaa gca agt ttc tgt ctt gaa gac    1254
Gln Arg Arg Val Ala Glu Gly His Lys Ala Ser Phe Cys Leu Glu Asp
            315                 320                 325

aca tcc tgt gac tat ggc tac cac agg cga ttt gca tgt act gca cac    1302
Thr Ser Cys Asp Tyr Gly Tyr His Arg Arg Phe Ala Cys Thr Ala His
            330                 335                 340

aca cag gga ttg agt cct ggc tgt tat gat acc tat ggt gca gac ata    1350
Thr Gln Gly Leu Ser Pro Gly Cys Tyr Asp Thr Tyr Gly Ala Asp Ile
            345                 350                 355

gac tgc cag tgg att gat att aca gat gta aaa cct gga aac tat atc    1398
Asp Cys Gln Trp Ile Asp Ile Thr Asp Val Lys Pro Gly Asn Tyr Ile
360                 365                 370                 375

cta aag gtc agt gta aac ccc agc tac ctg gtt cct gaa tct gac tat    1446
Leu Lys Val Ser Val Asn Pro Ser Tyr Leu Val Pro Glu Ser Asp Tyr
                380                 385                 390

acc aac aat gtt gtg cgc tgt gac att cgc tac aca gga cat cat gcg    1494
Thr Asn Asn Val Val Arg Cys Asp Ile Arg Tyr Thr Gly His His Ala
                395                 400                 405
```

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49321-111.ST25.txt

```
tat gcc tca ggc tgc aca att tca ccg tat tag aaggcaaagc aaaactccca    1547
Tyr Ala Ser Gly Cys Thr Ile Ser Pro Tyr
        410                 415

atggataaat cagtgcctgg tgttctgaag tgggaaaaaa tagactaact tcagtaggat    1607

ttatgtattt tgaaaaagag aacagaaaac aacaaaagaa tttttgtttg gactgttttc    1667

aataacaaag cacataactg dattttgaac gcttaagtca tcattacttg ggaatttttt    1727

aatgtttatt atttacatca ctttgtgaat taacacagtg tttcaattct gtaattacat    1787

atttgactct ttcaaagaaa tccaaatttc tcatgttcct tttgaaattg tagtgcaaaa    1847

tggtcagtat tatctaaatg aatgagccaa aatgactttg aactgaaact tttctaaagt    1907

gctggaactt tagtgaaaca taataataat gggtttata                           1946
```

<210> 26
<211> 417
<212> PRT
<213> Homo sapiens

<400> 26

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Met Arg Phe Ala Trp Thr Val Leu Leu Leu Gly Pro Leu Gln Leu Cys
1               5                   10                  15

Ala Leu Val His Cys Ala Pro Pro Ala Ala Gly Gln Gln Gln Pro Pro
                20                  25                  30

Arg Glu Pro Pro Ala Ala Pro Gly Ala Trp Arg Gln Gln Ile Gln Trp
            35              40                  45

Glu Asn Asn Gly Gln Val Phe Ser Leu Leu Ser Leu Gly Ser Gln Tyr
    50                  55                  60

Gln Pro Gln Arg Arg Arg Asp Pro Gly Ala Ala Val Pro Gly Ala Ala
65                  70                  75                  80

Asn Ala Ser Ala Gln Gln Pro Arg Thr Pro Ile Leu Leu Ile Arg Asp
                85                  90                  95

Asn Arg Thr Ala Ala Ala Arg Thr Arg Thr Ala Gly Ser Ser Gly Val
            100                 105                 110

Thr Ala Gly Arg Pro Arg Pro Thr Ala Arg His Trp Phe Gln Ala Gly
        115                 120                 125

Tyr Ser Thr Ser Arg Ala Arg Glu Ala Gly Ala Ser Arg Ala Glu Asn
    130                 135                 140
```

49321-111.ST25.txt
```
Gln Thr Ala Pro Gly Glu Val Pro Ala Leu Ser Asn Leu Arg Pro Pro
145             150             155                 160


Ser Arg Val Asp Gly Met Val Gly Asp Asp Pro Tyr Asn Pro Tyr Lys
                165             170                 175


Tyr Ser Asp Asp Asn Pro Tyr Tyr Asn Tyr Tyr Asp Thr Tyr Glu Arg
        180                 185                 190


Pro Arg Pro Gly Gly Arg Tyr Arg Pro Gly Tyr Gly Thr Gly Tyr Phe
        195                 200                 205


Gln Tyr Gly Leu Pro Asp Leu Val Ala Asp Pro Tyr Tyr Ile Gln Ala
    210                 215                 220


Ser Thr Tyr Val Gln Lys Met Ser Met Tyr Asn Leu Arg Cys Ala Ala
225                 230                 235                 240


Glu Glu Asn Cys Leu Ala Ser Thr Ala Tyr Arg Ala Asp Val Arg Asp
                245                 250                 255


Tyr Asp His Arg Val Leu Leu Arg Phe Pro Gln Arg Val Lys Asn Gln
            260                 265                 270


Gly Thr Ser Asp Phe Leu Pro Ser Arg Pro Arg Tyr Ser Trp Glu Trp
        275                 280                 285


His Ser Cys His Gln His Tyr His Ser Met Asp Glu Phe Ser His Tyr
    290                 295                 300


Asp Leu Leu Asp Ala Asn Thr Gln Arg Arg Val Ala Glu Gly His Lys
305                 310                 315                 320


Ala Ser Phe Cys Leu Glu Asp Thr Ser Cys Asp Tyr Gly Tyr His Arg
            325                 330                 335


Arg Phe Ala Cys Thr Ala His Thr Gln Gly Leu Ser Pro Gly Cys Tyr
            340                 345                 350


Asp Thr Tyr Gly Ala Asp Ile Asp Cys Gln Trp Ile Asp Ile Thr Asp
        355                 360                 365


Val Lys Pro Gly Asn Tyr Ile Leu Lys Val Ser Val Asn Pro Ser Tyr
    370                 375                 380


Leu Val Pro Glu Ser Asp Tyr Thr Asn Asn Val Val Arg Cys Asp Ile
385                 390                 395                 400
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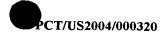
Page 48

49321-111.ST25.txt

```
Arg Tyr Thr Gly His His Ala Tyr Ala Ser Gly Cys Thr Ile Ser Pro
            405                 410                 415

Tyr


<210> 27
<211> 2389
<212> DNA
<213> Homo sapiens


<220>
<221> CDS
<222> (73)..(1146)

<400> 27
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gaaagcctga gc atg cag agt gtg cag agc acg agc ttt tgt ctc cga aag     111
              Met Gln Ser Val Gln Ser Thr Ser Phe Cys Leu Arg Lys
                1               5                   10

cag tgc ctt tgc ctg acc ttc ctg ctt ctc cat ctc ctg gga cag gtc     159
Gln Cys Leu Cys Leu Thr Phe Leu Leu Leu His Leu Leu Gly Gln Val
     15                  20                  25

gct gcg act cag cgc tgc cct ccc cag tgc ccg ggc cgg tgc cct gcg     207
Ala Ala Thr Gln Arg Cys Pro Pro Gln Cys Pro Gly Arg Cys Pro Ala
30                  35                  40                  45

acg ccg ccg acc tgc gcc ccc ggg gtg cgc gcg gtg ctg gac ggc tgc     255
Thr Pro Pro Thr Cys Ala Pro Gly Val Arg Ala Val Leu Asp Gly Cys
                50                  55                  60

tca tgc tgt ctg gtg tgt gcc cgc cag cgt ggc gag agc tgc tca gat     303
Ser Cys Cys Leu Val Cys Ala Arg Gln Arg Gly Glu Ser Cys Ser Asp
                65                  70                  75

ctg gag cca tgc gac gag agc agt ggc ctc tac tgt gat cgc agc gcg     351
Leu Glu Pro Cys Asp Glu Ser Ser Gly Leu Tyr Cys Asp Arg Ser Ala
            80                  85                  90

gac ccc agc aac cag act ggc atc tgc acg gcg gta gag gga gat aac     399
Asp Pro Ser Asn Gln Thr Gly Ile Cys Thr Ala Val Glu Gly Asp Asn
        95                  100                 105

tgt gtg ttc gat ggg gtc atc tac cgc agt gga gag aaa ttt cag cca     447
Cys Val Phe Asp Gly Val Ile Tyr Arg Ser Gly Glu Lys Phe Gln Pro
110                 115                 120                 125

agc tgc aaa ttc cag tgc acc tgc aga gat ggg cag att ggc tgt gtg     495
Ser Cys Lys Phe Gln Cys Thr Cys Arg Asp Gly Gln Ile Gly Cys Val
                130                 135                 140

ccc cgc tgt cag ctg gat gtg cta ctg cct gag cct aac tgc cca gct     543
Pro Arg Cys Gln Leu Asp Val Leu Leu Pro Glu Pro Asn Cys Pro Ala
            145                 150                 155

cca aga aaa gtt gag gtg cct gga gag tgc tgt gaa aag tgg atc tgt     591
Page 49
```

```
                                      49321-111.ST25.txt
Pro Arg Lys Val Glu Val Pro Gly Glu Cys Cys Glu Lys Trp Ile Cys
    160             165             170

ggc cca gat gag gag gat tca ctg gga ggc ctt acc ctt gca gct tac    639
Gly Pro Asp Glu Glu Asp Ser Leu Gly Gly Leu Thr Leu Ala Ala Tyr
    175             180             185

agg cca gaa gcc acc cta gga gta gaa·gtc tct gac tca agt gtc aac    687
Arg Pro Glu Ala Thr Leu Gly Val Glu Val Ser Asp Ser Ser Val Asn
190             195             200             205

tgc att gaa cag acc aca gag tgg aca gca tgc tcc aag agc tgt ggt    735
Cys Ile Glu Gln Thr Thr Glu Trp Thr Ala Cys Ser Lys Ser Cys Gly
            210             215             220

atg ggg ttc tcc acc cgg gtc acc aat agg aac cgt caa tgt gag atg    783
Met Gly Phe Ser Thr Arg Val Thr Asn Arg Asn Arg Gln Cys Glu Met
            225             230             235

ctg aaa cag act cgg ctc tgc atg gtg cgg ccc tgt gaa caa gag cca    831
Leu Lys Gln Thr Arg Leu Cys Met Val Arg Pro Cys Glu Gln Glu Pro
        240             245             250

gag cag cca aca gat aag aaa gga aaa aag tgt ctc cgc acc aag aag    879
Glu Gln Pro Thr Asp Lys Lys Gly Lys Lys Cys Leu Arg Thr Lys Lys
    255             260             265

tca ctc aaa gcc atc cac ctg cag ttc aag aac tgc acc agc ctg cac    927
Ser Leu Lys Ala Ile His Leu Gln Phe Lys Asn Cys Thr Ser Leu His
270             275             280             285

acc tac aag ccc agg ttc tgt ggg gtc tgc agt gat ggc cgc tgc tgc    975
Thr Tyr Lys Pro Arg Phe Cys Gly Val Cys Ser Asp Gly Arg Cys Cys
            290             295             300

act ccc cac aat acc aaa acc atc cag gca gag ttt cag tgc tcc cca   1023
Thr Pro His Asn Thr Lys Thr Ile Gln Ala Glu Phe Gln Cys Ser Pro
            305             310             315

ggg caa ata gtc aag aag cca gtg atg gtc att ggg acc tgc acc tgt   1071
Gly Gln Ile Val Lys Lys Pro Val Met Val Ile Gly Thr Cys Thr Cys
        320             325             330

cac acc aac tgt cct aag aac aat gag gcc ttc ctc cag gag ctg gag   1119
His Thr Asn Cys Pro Lys Asn Asn Glu Ala Phe Leu Gln Glu Leu Glu
    335             340             345

ctg aag act acc aga ggg aaa atg taa cctatcactc aagaagcaca          1166
Leu Lys Thr Thr Arg Gly Lys Met
350             355

cctacagagc acctgtagct gctgcgccac ccaccatcaa aggaatataa gaaaagtaat   1226

gaagaatcac gatttcatcc ttgaatccta tgtattttcc taatgtgatc atatgaggac   1286

ctttcatatc tgtcttttat ttaacaaaaa atgtaattaa ctgtaaactt ggaatcaagg   1346

taagctcagg atatggctta ggaatgactt actttcctgt ggttttatta caaatgcaaa   1406

tttctataaa tttaagaaaa caagtatata atttactttg tagactgttt cacattgcac   1466

tcatcatatt ttgttgtgca ctagtgcaat tccaagaaaa tatcactgta atgagtcagt   1526
```

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49321-111.ST25.txt

```
gaagtctaga atcatactta acatttcatt gtacaagtat tacaaccata tattgaggtt    1586

cattgggaag attctctatt ggctcccttt ttgggtaaac cagctctgaa cttccaagct    1646

ccaaatccaa ggaaacatgc agctcttcaa catgacatcc agagatgact attactttc     1706

tgtttagttt tacactagga aacgtgttgt atctacagta atgaaatgtt tactaagtgg    1766

actggtgtca taaactttct ccatttaaga cacattgact cctttccaat agaaagaaac    1826

taaacagaaa actcccaata caaagatgac tggtccctca tagccctcag acatttatat    1886

attggaagct gctgaggccc ccaagttttt taattaagca gaaacagcat attagcaggg    1946

attctctcat ctaactgatg agtaaactga ggcccaaagc acttgcttac atcctctgat    2006

agctgtttca aatgtgcatt ttgtggaatt ttgagaaaaa tagagcaaaa tcaacatgac    2066

tggtggtgag agaccacaca ttttatgaga gtttggaatt attgtagaca tgcccaaaac    2126

ttatccttgg gccataatta tgaaaactca tgatcaagat atatgtgtat acatacatgt    2186

atctggtttg tcaggctaca aggtaggctg caaaattaaa tctagacatt cttttaatgc    2246

caccacacgt gttccgcttc tctcttttaa agtatttata aaaatataaa ttgtacattt    2306

tgtaaaatat tatgtttgat ttctctactt gtcatatcac taaataaaca cgattttatt    2366

gctgaaaaaa aaaaaaaaaa aaa                                            2389
```

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<210>   28
<211>   357
<212>   PRT
<213>   Homo sapiens

<400>   28

Met Gln Ser Val Gln Ser Thr Ser Phe Cys Leu Arg Lys Gln Cys Leu
1               5                   10                  15


Cys Leu Thr Phe Leu Leu Leu His Leu Leu Gly Gln Val Ala Ala Thr
            20                  25                  30


Gln Arg Cys Pro Pro Gln Cys Pro Gly Arg Cys Pro Ala Thr Pro Pro
        35                  40                  45


Thr Cys Ala Pro Gly Val Arg Ala Val Leu Asp Gly Cys Ser Cys Cys
    50                  55                  60


Leu Val Cys Ala Arg Gln Arg Gly Glu Ser Cys Ser Asp Leu Glu Pro
65                  70                  75                  80


Cys Asp Glu Ser Ser Gly Leu Tyr Cys Asp Arg Ser Ala Asp Pro Ser
                85                  90                  95


Asn Gln Thr Gly Ile Cys Thr Ala Val Glu Gly Asp Asn Cys Val Phe
                            Page 51
```

```
                              49321-111.ST25.txt
           100                    105                 110
```

Asp Gly Val Ile Tyr Arg Ser Gly Glu Lys Phe Gln Pro Ser Cys Lys
          115   120   125

Phe Gln Cys Thr Cys Arg Asp Gly Gln Ile Gly Cys Val Pro Arg Cys
    130   135   140

Gln Leu Asp Val Leu Leu Pro Glu Pro Asn Cys Pro Ala Pro Arg Lys
145   150   155   160

Val Glu Val Pro Gly Glu Cys Cys Glu Lys Trp Ile Cys Gly Pro Asp
              165   170   175

Glu Glu Asp Ser Leu Gly Gly Leu Thr Leu Ala Ala Tyr Arg Pro Glu
          180   185   190

Ala Thr Leu Gly Val Glu Val Ser Asp Ser Ser Val Asn Cys Ile Glu
        195   200   205

Gln Thr Thr Glu Trp Thr Ala Cys Ser Lys Ser Cys Gly Met Gly Phe
    210   215   220

Ser Thr Arg Val Thr Asn Arg Asn Arg Gln Cys Glu Met Leu Lys Gln
225   230   235   240

Thr Arg Leu Cys Met Val Arg Pro Cys Glu Gln Glu Pro Glu Gln Pro
              245   250   255

Thr Asp Lys Lys Gly Lys Lys Cys Leu Arg Thr Lys Lys Ser Leu Lys
          260   265   270

Ala Ile His Leu Gln Phe Lys Asn Cys Thr Ser Leu His Thr Tyr Lys
        275   280   285

Pro Arg Phe Cys Gly Val Cys Ser Asp Gly Arg Cys Cys Thr Pro His
    290   295   300

Asn Thr Lys Thr Ile Gln Ala Glu Phe Gln Cys Ser Pro Gly Gln Ile
305   310   315   320

Val Lys Lys Pro Val Met Val Ile Gly Thr Cys Thr Cys His Thr Asn
          325   330   335

Cys Pro Lys Asn Asn Glu Ala Phe Leu Gln Glu Leu Glu Leu Lys Thr
          340   345   350

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Thr Arg Gly Lys Met
        355

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<212> DNA
<213> Homo sapiens

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                         Met Arg Pro Leu Cys Val Thr Cys Trp Trp
                         1   5   10

ctc gga ctg ctg gct gcc atg gga gct gtt gca ggc cag gag gac ggt   99
Leu Gly Leu Leu Ala Ala Met Gly Ala Val Ala Gly Gln Glu Asp Gly
                15   20   25

ttt gag ggc act gag gag ggc tcg cca aga gag ttc att tac cta aac   147
Phe Glu Gly Thr Glu Glu Gly Ser Pro Arg Glu Phe Ile Tyr Leu Asn
            30   35   40

agg tac aag cgg gcg ggc gag tcc cag gac aag tgc acc tac acc ttc   195
Arg Tyr Lys Arg Ala Gly Glu Ser Gln Asp Lys Cys Thr Tyr Thr Phe
        45   50   55

att gtg ccc cag cag cgg gtc acg ggt gcc atc tgc gtc aac tcc aag   243
Ile Val Pro Gln Gln Arg Val Thr Gly Ala Ile Cys Val Asn Ser Lys
    60   65   70

gag cct gag gtg ctt ctg gag aac cga gtg cat aag cag gag cta gag   291
Glu Pro Glu Val Leu Leu Glu Asn Arg Val His Lys Gln Glu Leu Glu
75   80   85   90

ctg ctc aac aat gag ctg ctc aag cag aag cgg cag atc gag aca ctg   339
Leu Leu Asn Asn Glu Leu Leu Lys Gln Lys Arg Gln Ile Glu Thr Leu
                95   100   105

cag cag ctg gtg gag gtg gac ggc ggc att gtg agc gag gtg aag ctg   387
Gln Gln Leu Val Glu Val Asp Gly Gly Ile Val Ser Glu Val Lys Leu
            110   115   120

ctg cgc aag gag agc cgc aac atg aac tcg cgg gtc acg cag ctc tac   435
Leu Arg Lys Glu Ser Arg Asn Met Asn Ser Arg Val Thr Gln Leu Tyr
        125   130   135

atg cag ctc ctg cac gag atc atc cgc aag cgg gac aac gcg ttg gag   483
Met Gln Leu Leu His Glu Ile Ile Arg Lys Arg Asp Asn Ala Leu Glu
    140   145   150

ctc tcc cag ctg gag aac agg atc ctg aac cag aca gcc gac atg ctg   531
Leu Ser Gln Leu Glu Asn Arg Ile Leu Asn Gln Thr Ala Asp Met Leu
155   160   165   170

cag ctg gcc agc aag tac aag gac ctg gag cac aag tac cag cac ctg   579
Gln Leu Ala Ser Lys Tyr Lys Asp Leu Glu His Lys Tyr Gln His Leu
                175   180   185

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                                    49321-111.ST25.txt
gcc aca ctg gcc cac aac caa tca gag atc atc gcg cag ctt gag gag    627
Ala Thr Leu Ala His Asn Gln Ser Glu Ile Ile Ala Gln Leu Glu Glu
            190                 195                 200

cac tgc cag agg gtg ccc tcg gcc agg ccc gtc ccc cag cca ccc ccc    675
His Cys Gln Arg Val Pro Ser Ala Arg Pro Val Pro Gln Pro Pro Pro
            205                 210                 215

gct gcc ccg ccc cgg gtc tac caa cca ccc acc tac aac cgc atc atc    723
Ala Ala Pro Pro Arg Val Tyr Gln Pro Pro Thr Tyr Asn Arg Ile Ile
            220                 225                 230

aac cag atc tct acc aac gag atc cag agt gac cag aac ctg aag gtg    771
Asn Gln Ile Ser Thr Asn Glu Ile Gln Ser Asp Gln Asn Leu Lys Val
235                 240                 245                 250

ctg cca ccc cct ctg ccc act atg ccc act ctc acc agc ctc cca tct    819
Leu Pro Pro Pro Leu Pro Thr Met Pro Thr Leu Thr Ser Leu Pro Ser
            255                 260                 265

tcc acc gac aag ccg tcg ggc cca tgg aga gac tgc ctg cag gcc ctg    867
Ser Thr Asp Lys Pro Ser Gly Pro Trp Arg Asp Cys Leu Gln Ala Leu
            270                 275                 280

gag gat ggc cac gac acc agc tcc atc tac ctg gtg aag ccg gag aac    915
Glu Asp Gly His Asp Thr Ser Ser Ile Tyr Leu Val Lys Pro Glu Asn
            285                 290                 295

acc aac cgc ctc atg cag gtg tgg tgc gac cag aga cac gac ccc ggg    963
Thr Asn Arg Leu Met Gln Val Trp Cys Asp Gln Arg His Asp Pro Gly
300                 305                 310

ggc tgg acc gtc atc cag aga cgc ctg gat ggc tct gtt aac ttc ttc    1011
Gly Trp Thr Val Ile Gln Arg Arg Leu Asp Gly Ser Val Asn Phe Phe
315                 320                 325                 330

agg aac tgg gag acg tac aag caa ggg ttt ggg aac att gat ggc gaa    1059
Arg Asn Trp Glu Thr Tyr Lys Gln Gly Phe Gly Asn Ile Asp Gly Glu
            335                 340                 345

tac tgg ctg ggc ctg gag aac att tac tgg ctg acg aac caa ggc aac    1107
Tyr Trp Leu Gly Leu Glu Asn Ile Tyr Trp Leu Thr Asn Gln Gly Asn
            350                 355                 360

tac aaa ctc ctg gtg acc atg gag gac tgg tcc ggc cgc aaa gtc ttt    1155
Tyr Lys Leu Leu Val Thr Met Glu Asp Trp Ser Gly Arg Lys Val Phe
            365                 370                 375

gca gaa tac gcc agt ttc cgc ctg gaa cct gag agc gag tat tat aag    1203
Ala Glu Tyr Ala Ser Phe Arg Leu Glu Pro Glu Ser Glu Tyr Tyr Lys
380                 385                 390

ctg cgg ctg ggg cgc tac cat ggc aat gcg ggt gac tcc ttt aca tgg    1251
Leu Arg Leu Gly Arg Tyr His Gly Asn Ala Gly Asp Ser Phe Thr Trp
395                 400                 405                 410

cac aac ggc aag cag ttc acc acc ctg gac aga gat cat gat gtc tac    1299
His Asn Gly Lys Gln Phe Thr Thr Leu Asp Arg Asp His Asp Val Tyr
            415                 420                 425

aca gga aac tgt gcc cac tac cag aag gga ggc tgg tgg tat aac gcc    1347
Thr Gly Asn Cys Ala His Tyr Gln Lys Gly Gly Trp Trp Tyr Asn Ala
            430                 435                 440
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```
tgt gcc cac tcc aac ctc aac ggg gtc tgg tac cgc ggg ggc cat tac        1395
Cys Ala His Ser Asn Leu Asn Gly Val Trp Tyr Arg Gly Gly His Tyr
        445         450                   455

cgg agc cgc tac cag gac gga gtc tac tgg gct gag ttc cga gga ggc        1443
Arg Ser Arg Tyr Gln Asp Gly Val Tyr Trp Ala Glu Phe Arg Gly Gly
    460             465             470

tct tac tca ctc aag aaa gtg gtg atg atg atc cga ccg aac ccc aac        1491
Ser Tyr Ser Leu Lys Lys Val Val Met Met Ile Arg Pro Asn Pro Asn
475             480             485             490

acc ttc cac taa gccagctccc cctcc                                        1518
Thr Phe His
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1               5                   10                  15

Met Gly Ala Val Ala Gly Gln Glu Asp Gly Phe Glu Gly Thr Glu Glu
                20                  25                  30

Gly Ser Pro Arg Glu Phe Ile Tyr Leu Asn Arg Tyr Lys Arg Ala Gly
            35                  40                  45

Glu Ser Gln Asp Lys Cys Thr Tyr Thr Phe Ile Val Pro Gln Gln Arg
    50                  55                  60

Val Thr Gly Ala Ile Cys Val Asn Ser Lys Glu Pro Glu Val Leu Leu
65                  70                  75                  80

Glu Asn Arg Val His Lys Gln Glu Leu Glu Leu Leu Asn Asn Glu Leu
                85                  90                  95

Leu Lys Gln Lys Arg Gln Ile Glu Thr Leu Gln Gln Leu Val Glu Val
            100                 105                 110

Asp Gly Gly Ile Val Ser Glu Val Lys Leu Leu Arg Lys Glu Ser Arg
        115                 120                 125

Asn Met Asn Ser Arg Val Thr Gln Leu Tyr Met Gln Leu Leu His Glu
    130                 135                 140

Ile Ile Arg Lys Arg Asp Asn Ala Leu Glu Leu Ser Gln Leu Glu Asn
145                 150                 155                 160
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Arg Ile Leu Asn Gln Thr Ala Asp Met Leu Gln Leu Ala Ser Lys Tyr
              165             170             175

Lys Asp Leu Glu His Lys Tyr Gln His Leu Ala Thr Leu Ala His Asn
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Gln Ser Glu Ile Ile Ala Gln Leu Glu Glu His Cys Gln Arg Val Pro
          195             200             205

Ser Ala Arg Pro Val Pro Gln Pro Pro Pro Ala Ala Pro Pro Arg Val
      210             215             220

Tyr Gln Pro Pro Thr Tyr Asn Arg Ile Ile Asn Gln Ile Ser Thr Asn
225             230             235             240

Glu Ile Gln Ser Asp Gln Asn Leu Lys Val Leu Pro Pro Pro Leu Pro
              245             250             255

Thr Met Pro Thr Leu Thr Ser Leu Pro Ser Ser Thr Asp Lys Pro Ser
              260             . 265             270

Gly Pro Trp Arg Asp Cys Leu Gln Ala Leu Glu Asp Gly His Asp Thr
          275             280             285

Ser Ser Ile Tyr Leu Val Lys Pro Glu Asn Thr Asn Arg Leu Met Gln
      290             295             300

Val Trp Cys Asp Gln Arg His Asp Pro Gly Gly Trp Thr Val Ile Gln
305             310             315             320

Arg Arg Leu Asp Gly Ser Val Asn Phe Phe Arg Asn Trp Glu Thr Tyr
          325             330             335

Lys Gln Gly Phe Gly Asn Ile Asp Gly Glu Tyr Trp Leu Gly Leu Glu
          340             345             350

Asn Ile Tyr Trp Leu Thr Asn Gln Gly Asn Tyr Lys Leu Leu Val Thr
          355             360             365

Met Glu Asp Trp Ser Gly Arg Lys Val Phe Ala Glu Tyr Ala Ser Phe
      370             375             380

Arg Leu Glu Pro Glu Ser Glu Tyr Tyr Lys Leu Arg Leu Gly Arg Tyr
385             390             395             400

His Gly Asn Ala Gly Asp Ser Phe Thr Trp His Asn Gly Lys Gln Phe
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              405   410   415

      Thr Thr Leu Asp Arg Asp His Asp Val Tyr Thr Gly Asn Cys Ala His
                  420   425   430

      Tyr Gln Lys Gly Gly Trp Trp Tyr Asn Ala Cys Ala His Ser Asn Leu
              435   .   440   445

      Asn Gly Val Trp Tyr Arg Gly Gly His Tyr Arg Ser Arg Tyr Gln Asp
          450   455   460

      Gly Val Tyr Trp Ala Glu Phe Arg Gly Gly Ser Tyr Ser Leu Lys Lys
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      Val Val Met Met Ile Arg Pro Asn Pro Asn Thr Phe His
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agctcgtgct ctgcacactc tgcat   25

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agcatgtcac gcacagtggc ctcat   25